

STATE OF HAWAII
DEPARTMENT OF HEALTH
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In reply, please refer to:
File:

March 9, 2022

59-25 S106 ltr (initial) SHPD.docx

Alan S. Downer, Ph.D., Administrator
State of Hawai'i, Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Boulevard, Rm. 555
Kapolei, HI 96707
Submitted via: SHPD HICRIS

Dear Dr. Downer:

Subject: National Historic Preservation Act (NHPA)
Request to Initiate Section 106 Consultation
BMP Improvements at Various Refuse Transfer Stations
Clean Water State Revolving Fund (CWSRF) Project No. C150059-25
Hanapēpē Ahupua'a, Waimea District; Hanamā'ulu Ahupua'a, Līhu'e District; Kapa'a
Ahupua'a, Kawaihau District; Kalihikai Ahupua'a, Hanalei District, Island of Kaua'i
TMK(s): (4) 1-8-008; (4) 3-7-002; (4) 4-6-012; (4) 5-3-001 and -008
State Historic Preservation Division (SHPD) Project No. 2022PR00115

On behalf of the Environmental Protection Agency (EPA), the State of Hawai'i Department of Health (DOH) requests to initiate Section 106 consultation with the State Historic Preservation Officer (SHPO) for the proposed BMP Improvements at Various Refuse Transfer Stations project located in Hanapēpē Ahupua'a, Waimea District; Hanamā'ulu Ahupua'a, Līhu'e District; Kapa'a Ahupua'a, Kawaihau District; Kalihikai Ahupua'a, Hanalei District, Island of Kaua'i.

The proposed project may be eligible to utilize federal funding that is administered by the DOH through the CWSRF and will be considered a federal action and undertaking, as defined by Section 106 of the NHPA of 1966 (as amended 2014), Title 54 of the United States Code (54 USC) Section 306108, and Title 36 of the Code of Federal Regulations (36 CFR) Part 800.

The EPA has authorized the DOH to act on behalf of the EPA regarding NHPA Section 106 notification and consultation. This letter is to request to initiate the Section 106 consultation process with the SHPO and SHPD in accordance with 36 CFR, Section 800.3.

The DOH may provide funding under the CWSRF to the County of Kaua'i, Department of Public Works for the BMP Improvements at Various Refuse Transfer Stations project.

Overview of Undertaking

The proposed project areas, as shown in *Attachment A*, are located in Hanapēpē, Līhu'e, Kapa'a, and Hanalei, Kaua'i Island, Hawaii, as follows:

- Located at 4380 Lele Road, the Hanapēpē refuse transfer station Area of Potential Effects (APE) includes 3.35 acres of land occupying TMK: (4) 1-8-008:079, a portion of TMK: (4) 1-8-008:045, and a portion of TMK: (4) 1-8-008:999 in Hanapēpē Ahupuaʻa, Waimea District.
- Located at 3450 Ahukini Road adjacent to the northwest portion of Līhuʻe Airport, the Līhuʻe refuse transfer station APE includes 3.35 acres of land occupying a portion of TMK: (4) 3-7-002:014, a portion of (4) 3-7-002:001, and a portion of (4) 3-7-002:016 in Hanamāʻulu Ahupuaʻa, Līhuʻe District.
- Located at 5051 Kahi Road, the Kapaʻa refuse transfer station APE includes 3.97 acres of land occupying TMK: (4) 4-6-012:004, a portion of TMK: (4) 4-6-012:003, and a portion of TMK: (4) 4-6-012:110 within Kapaʻa Ahupuaʻa, Kawaihau District.
- Located at 5-3751 Kūhiō Highway, the Hanalei Transfer Station APE is 1.91 acres comprising TMK: (4) 5-3-001:017, a portion of TMK: (4) 5-3-001:002, and a portion of TMK: (4) 5-3-008:099 in Kalihikai Ahupuaʻa, Hanalei District.

See *Attachment B* for depictions of the APE for each site.

The County of Kauaʻi (County) is proposing upgrades to facilities at four refuse transfer stations: Hanapēpē Refuse Transfer Station, Līhuʻe Refuse Transfer Station, Kapaʻa Refuse Transfer Station, and Hanalei Refuse Transfer Station. The County intends to improve site conditions related to stormwater conveyance and segregation of water flows to enhance compliance with the National Pollutant Discharge Elimination System (NPDES) regulations at these four refuse transfer stations.

The project's design efforts intend to get the sites in full compliance with NPDES stormwater guidance for Type B (Industrial Activities) sites. The design improvements will reduce the water collection in these discrete areas at these sites, which is being remedied by the project.

The site improvements will generally address issues noted in past compliance inspections, reports, and other documentation and will include improvements to the following:

- Concrete pad and tipping floor areas for disposal operations.
- Drop-off areas with roll-off and recycling bins.
- Retaining walls, containment curbs, and berms.
- Truck wash areas.
- Storage and queuing areas, including the installation of pre-engineered metal canopies for the industrial operations at the facilities.
- Stormwater conveyance infrastructure through the incorporation of low-impact development (LID) features, including bioswales and rock-lined channels.
- Installation of a new leachate-collection system including leachate storage tanks.
- Electrical service required for the installation of lighting and security features.

Cultural, Historical, and Archaeological Background

ASM Affiliates conducted a synthesis of prior archaeological, cultural, and historical research relevant to each APE at all four refuse transfer stations and prepared a report with the following findings:

Hanapēpē Refuse Transfer Station:

During Precontact times, the Hanapēpē area, particularly Hanapēpē Valley supported extensive taro fields, both irrigated and dry; and along the coast, there was numerous fishpond that was used for both agriculture and aquaculture. As mentioned, salt was harvested from ancient salt pans pockmarking the coast, and there were significant surf breaks that were traditionally recognized off Hanapēpē's shores (Finney and Houston 1966). The Hanapēpē refuse transfer station is situated inland about 0.16 miles from the coastal salt pans.

The archaeological expectations for the Hanapēpē refuse transfer station APE are meager at best. The extensive use of the APE associated with the existing refuse transfer station and adjoining County base yard likely destroyed any evidence of past land use from the Precontact or Historic Period.

Līhu'e Refuse Transfer Station:

The Līhu'e refuse transfer station APE is located in the ahupua'a of Hanamā'ulu within the traditional moku or district of Puna (modern district of Līhu'e). Hanamā'ulu is bounded on the north by Wailua Ahupua'a and the south by Kalapakī Ahupua'a. The Puna District extended from Kipu, south of Līhu'e to Kama'oma'o'o, just north of Kealia. District names and boundaries went through modification during the 1840s when the Puna District became the Līhu'e District, named for its primary town.

The archaeological expectations for the Līhu'e refuse transfer station APE are meager at best. The extensive Historic Period agriculture activities associated with sugarcane cultivation likely destroyed any Precontact cultural remains that may have been present, and the modern development of the existing refuse transfer station and adjoining recycling facility likely destroyed any evidence of Historic Period land use.

Kapa'a Refuse Transfer Station:

Precontact use of the general vicinity of the Kapa'a refuse transfer station APE appears to have centered on dry land cultivation and resource collection; ephemeral site types that do not preserve well in the archaeological record. The specific property has been used as a public dumping ground since at least the middle of the twentieth century and it is anticipated that extensive bulldozing had occurred in the area before the establishment of the current use, which itself has had an extensive impact on both the surface and subsurface environment.

Evidence of the historic use of the property as a dump is likely to be observed around the periphery of the currently developed transfer station infrastructure; however, discovering evidence of such activity might not lead to the identification of a historic property or at least one of any significance.

Hanalei Refuse Transfer Station:

The Hanalei refuse transfer station is located in Kalihikai Ahupua'a in the traditional district of Halele'a (modern district of Hanalei). There are relatively few legendary references to Kalihikai Ahupua'a, and when it is mentioned, it is only in passing. Traditionally, Kalihikai was important agriculturally as its narrow gulches brought fresh water from three small streams to the long, flat alluvial lands makai of the current APE. Earle (Earle 1978:149) identified five pond field irrigation systems in the coastal portion of Kalihikai that were used from Precontact times into the 1850s, which he documented both archaeologically and through Māhele records.

During the Precontact Period, the Hanalei refuse transfer station APE might have seen opportunistic agricultural use along intermittent streams, however, beginning in the middle 1800s this area was developed for commercial farming and later as pasturelands. These historic activities likely destroyed any Precontact cultural remains that may have been present, and the modern development of the existing refuse transfer station likely destroyed any evidence of Historic Period land use. Although highly unlikely, the remote possibility does remain that scant remnants of either Precontact or Historic Period agricultural features might remain along the margins of APE.

More detailed information on the cultural, archaeological, and historical settings of the project area and the evaluation of eligibility are provided in the study prepared for this project by Rechtman and Barna (*Attachment C*).

Summary of Archaeological Sites within the APE

Fieldwork at all four refuse transfer stations was conducted on December 2, 2020, by Robert B. Rechtman, Ph.D. and Cyrus Hulen, B.A. The field crew visually examined the already developed portions of the respective APEs and more formally surveyed the currently undeveloped portions of the APEs by walking transects spaced at 5-meter intervals. The boundaries of the APEs were identified in the field using a handheld tablet computer running ESRI's Collector application connected to an EOS Arrow 100 GNSS receiver with sub-meter accuracy.

Based on this fieldwork and a literature review of all four sites, a report entitled, *An Archaeological Study in Compliance with Section 106 of the National Historic Preservation Act and Hawai'i Revised Statutes Chapter 6E-8 for Improvements at Four County of Kaua'i Transfer Stations*, by Robert B. Rechtman, Ph.D. and Benjamin Barna, Ph.D. was produced in February 2021 (*Attachment C*).

No historic properties were observed within any of the four APEs. As no historic properties were identified, in accordance with 36 CFR 800.4(d)(1), A Section 106 determination of no historic properties affected is anticipated.

Hanapēpē Refuse Transfer Station:

No archaeological site, features, or cultural deposits were observed within the Hanapēpē refuse transfer station APE.

Līhu'e Refuse Transfer Station:

No archaeological site, features, or cultural deposits were observed within the Līhu'e refuse transfer station APE.

Kapa'a Refuse Transfer Station:

Archival research indicated that the Kapa'a refuse transfer station APE was a public "dumping grounds" dating back to the middle twentieth century. During the current fieldwork, rubbish was observed scattered around the APE, some of which could date back to the period when the modern refuse station was used as a dump. However, what was observed was not a discrete deposit that would represent intact deposition. Rather, there was a mix of recent and historic material as one would expect at a trash dump location. Further, even if an intact section of the original dumping ground could be identified, with respect to the significance criteria contained in 36 CFR part 63 such a site would be considered a common property type that does not have

the potential to provide information about history that is not available through historic research, and thus would not be eligible for listing in the National Register of Historic Places.

Hanalei Refuse Transfer Station:

No archaeological sites, features, or cultural deposits were observed within the Hanalei refuse transfer station APE.

Consultations

Section 106 consultation letters have also been sent to Native Hawaiian organizations, consulting parties, and/or interested persons that might attach significance to this area and have invited them to participate in the process. The mailing list is provided as *Attachment D*.

We welcome any comments that you may have on this project's proposed improvements.

We are particularly interested in any information you may have on the historic and cultural sites that have been recorded in the area. In addition, if you are acquainted with any persons or organizations that are knowledgeable about the proposed project area or any descendants with ancestral, lineal, or cultural ties to, cultural knowledge or concerns for, and/or cultural or religious attachment to the proposed project area, then we would appreciate receiving their names and contact information.

We would appreciate a written response within thirty (30) calendar days from receipt of this letter. Please address any written comments to email: jonathan.nagato@doh.hawaii.gov or the following address:

Attn: Jon Nagato
Department of Health, Wastewater Branch
2827 Waimano Home Road, Room 207
Pearl City, HI 96782

Should you have any questions, please contact Jon Nagato of our Branch at (808) 586-4294.

Sincerely,



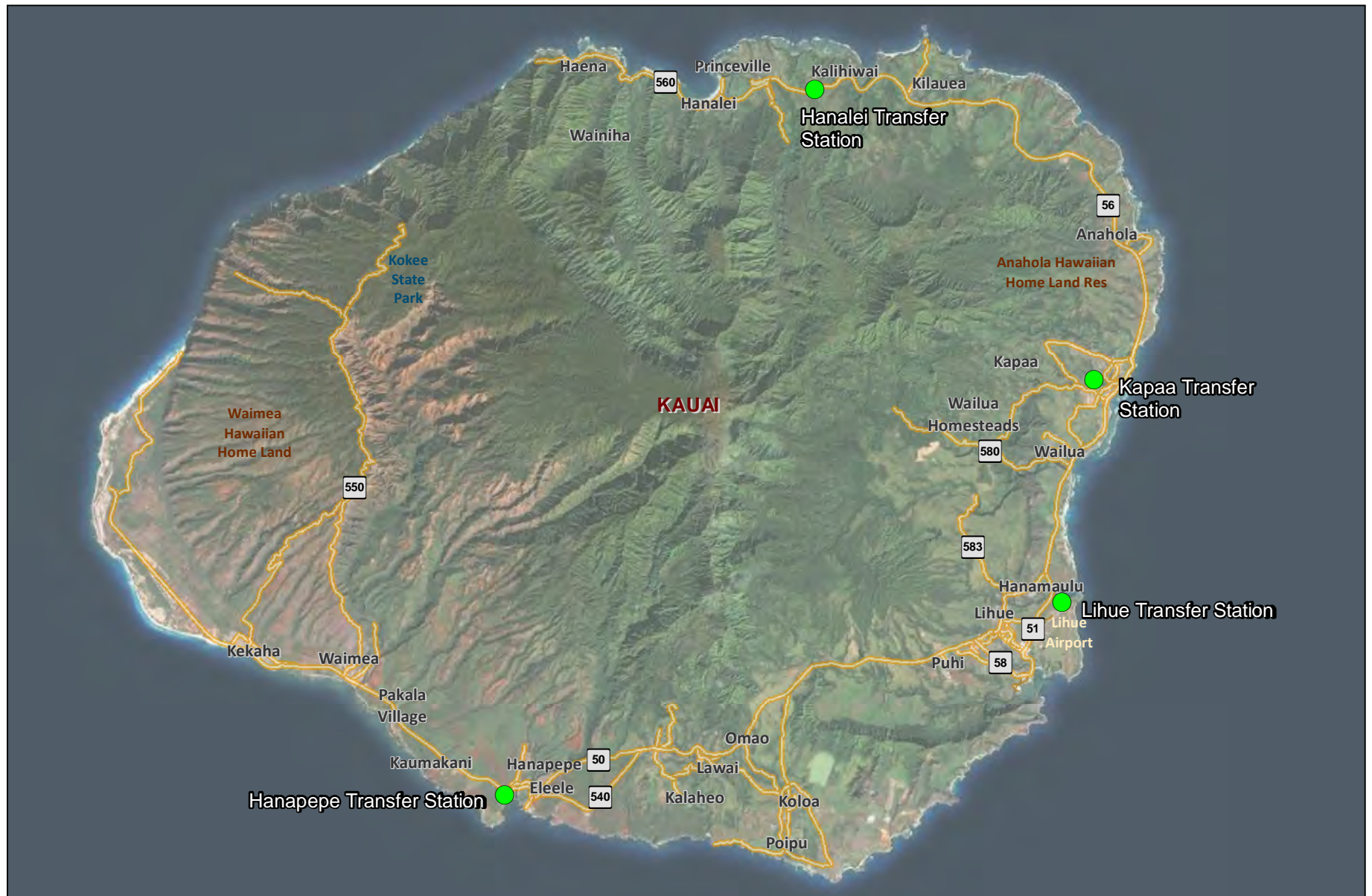
SINA PRUDER, P.E., CHIEF
Wastewater Branch

Attachments

CH:

c: Troy Tanigawa (via email at TTanigawa@kauai.gov)
Allison Fraley (via email at AFraley@kauai.gov)

Attachment A



LEGEND

● Approximate Location of Transfer Stations

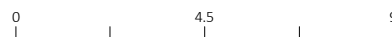


FIGURE 1
Site Locations

Attachment B

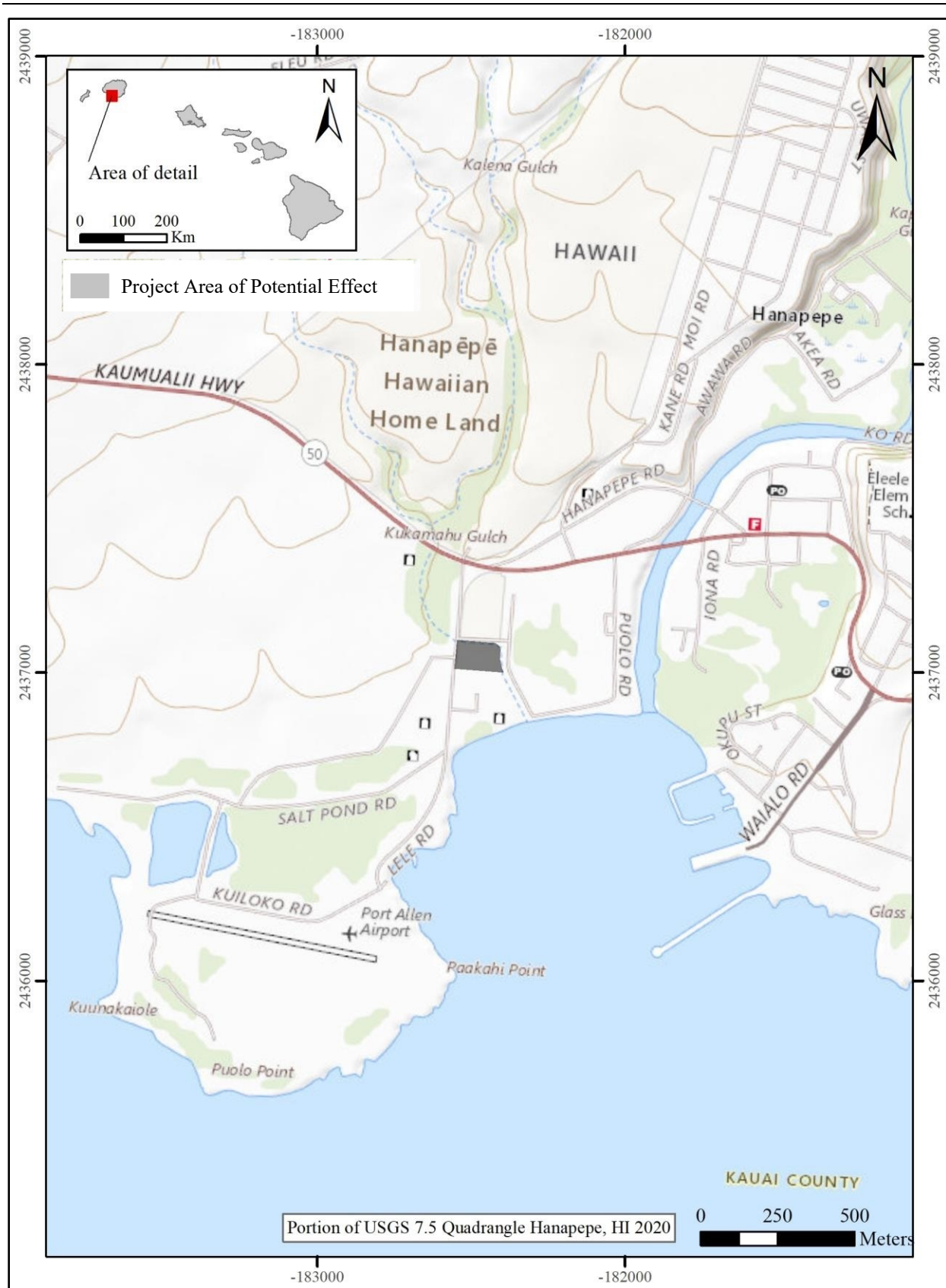


Figure 2. Hanapēpē Refuse Transfer Station Area of Potential Effect

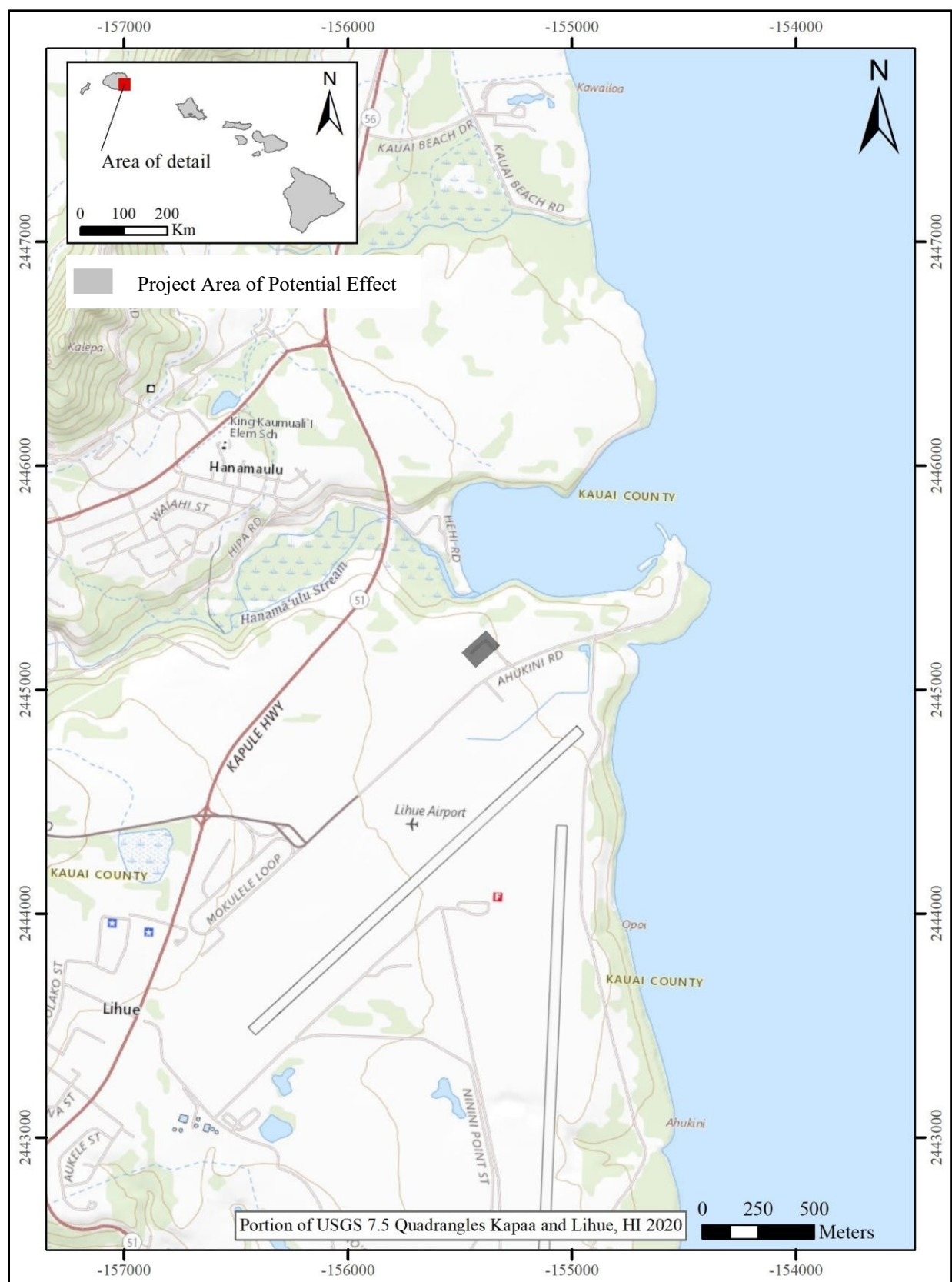


Figure 3. Lihue Refuse Transfer Station Area of Potential Effect

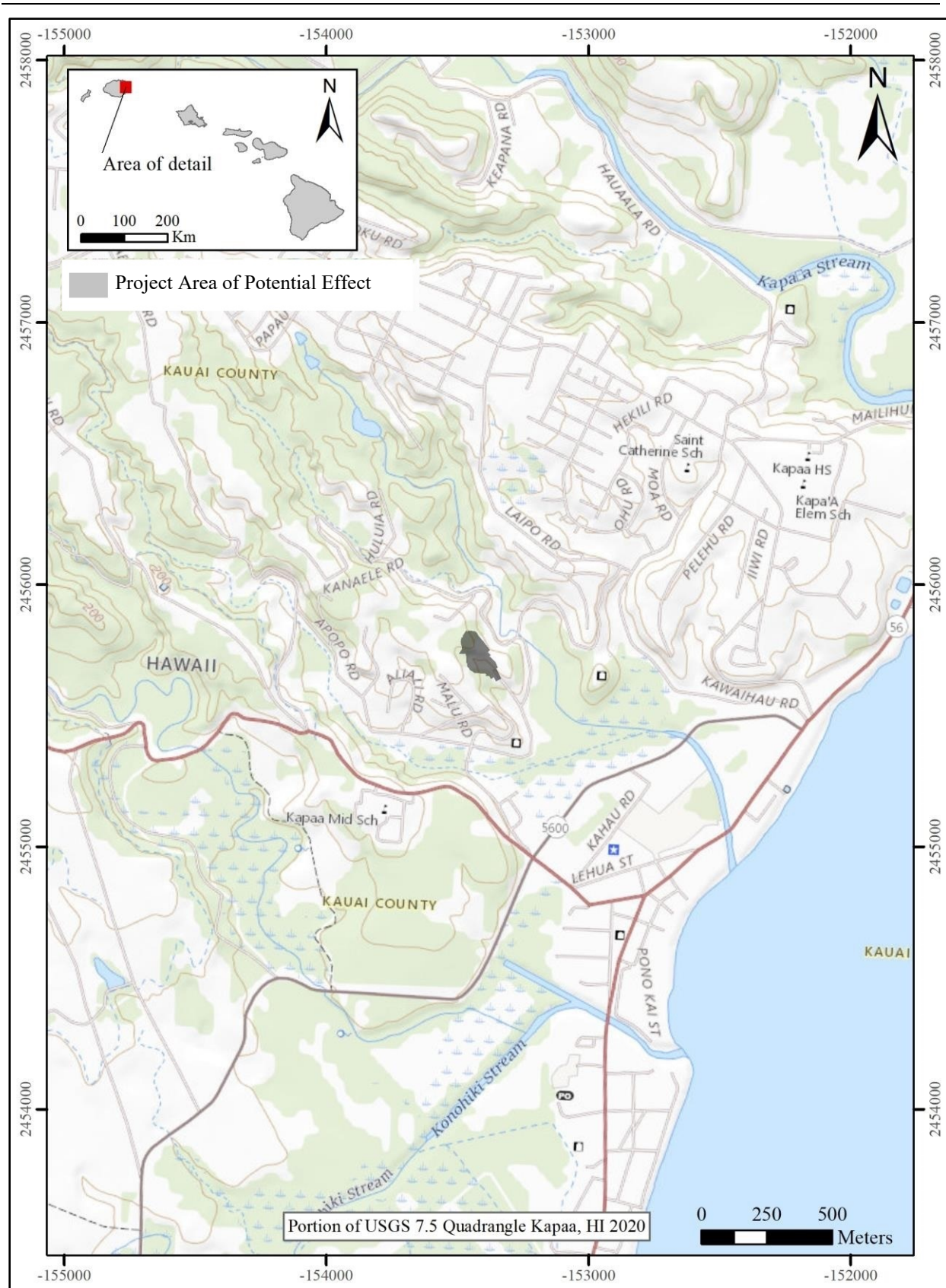


Figure 4. Kapa'a Refuse Transfer Station Area of Potential Effect

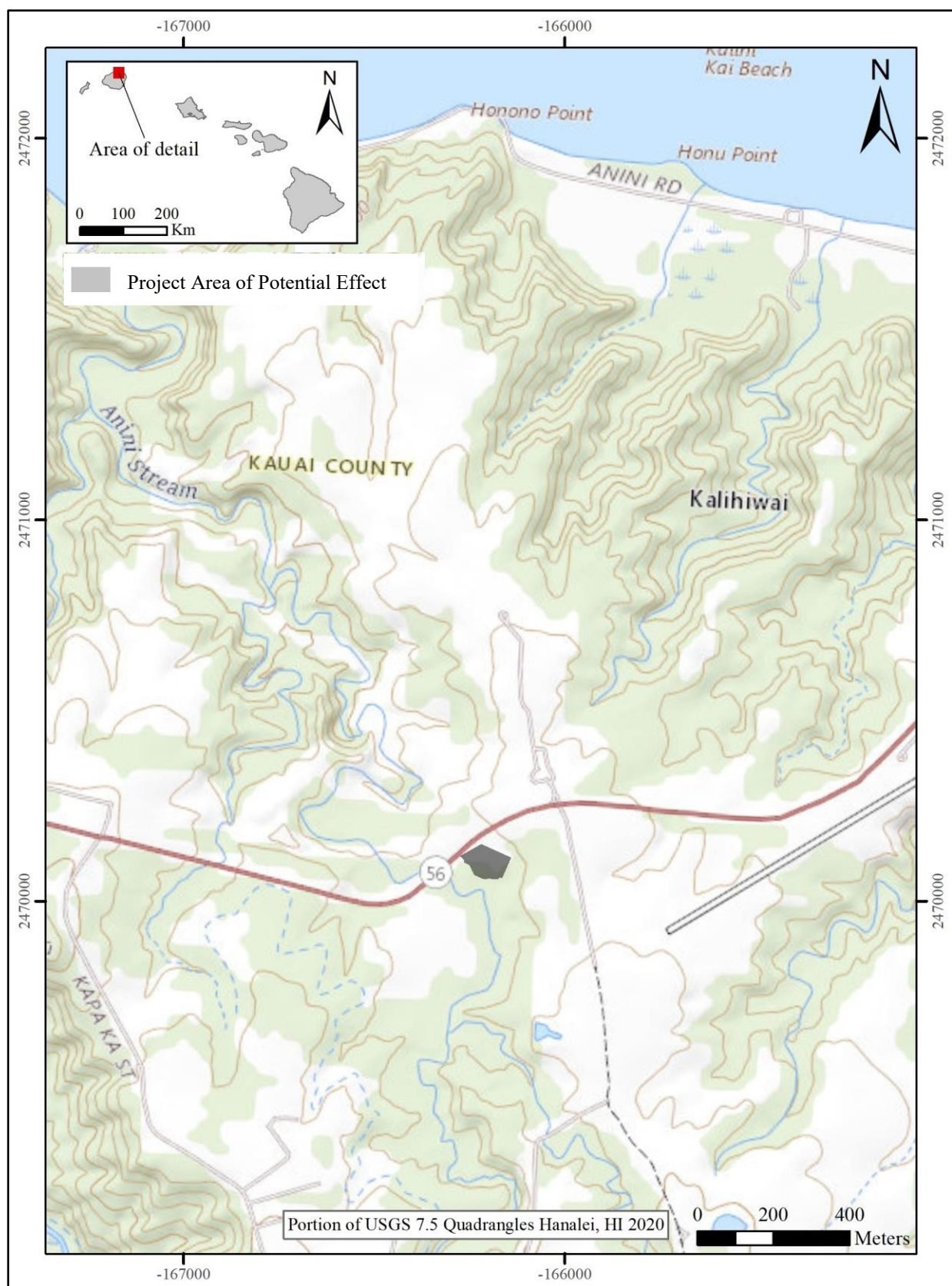


Figure 5. Hanalei Refuse Transfer Station Area of Potential Effect

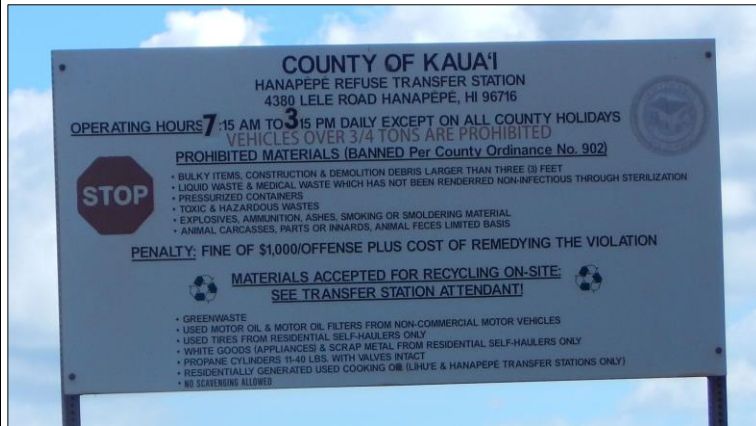
Attachment C

An Archaeological Study in Compliance with Section 106 of the National Historic Preservation Act and Hawai'i Revised Statutes Chapter 6E-8 for Improvements at Four County of Kaua'i Transfer Stations

TMKs: (4) 1-8-008:079, 045 por., and 999 por.; (4) 3-7-002:014, 001 por., and 016 por.; (4) 4-6-012:004, 003 por., and 110 por.; (4) 5-3-001:017, 002 por.; and (4) 5-3-008:999 por.

Hanamā'ulu Ahupua'a, Lihu'e District,
Hanapēpē Ahupua'a, Waimea District,
Kalihikai Ahupua'a, Hanalei District,
Kapa'a Ahupua'a, Kawaihau District,
Island of Kaua'i

DRAFT



Prepared By:

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Benjamin Barna, Ph.D.

Prepared For:

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January 2021



Archaeology • History • Ethnography • Architectural History

Office: (808) 969-6066 • Fax: (808) 443-0065

ASM Project Number 36250.00

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Hanapēpē Ahupua‘a, Waimea District,
Kalihikai Ahupua‘a, Hanalei District,
Kapa‘a Ahupua‘a, Kawaihau District,
Island of Kaua‘i

EXECUTIVE SUMMARY

At the request of Jacobs Engineering, Inc. on behalf of the County of Kauaʻi (landowner, Delegated Agency), ASM Affiliates (ASM) conducted archaeological investigations to support physical site improvements at four County of Kauaʻi refuse transfer stations—Hanalei Transfer Station, Hanapēpē Transfer Station, Kapaʻa Transfer Station, and Līhuʻe Transfer Station. The County of Kauaʻi intends to improve site conditions related to storm water conveyance and segregation of water flows to enhance compliance with the National Pollutant Discharge Elimination System (NPDES) regulations at these four transfer stations. To accomplish this, the County of Kauaʻi will be securing funding under the Clean Water State Revolving Fund (CWSRF) for design and construction of the site improvements thus creating a federal nexus for this project that requires compliance with Section 106 of the National Historic Preservation Act. As a county project, the development actions are also subject to review under Hawaiʻi Revised Statutes Chapter 6E-8 and thus the current study was also prepared in compliance with Hawaiʻi Administrative Rules (HAR) 13§13–275 and performed in accordance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports as contained in HAR 13§13–276.

Located at 5-3751 Kūhiō Highway, the Hanalei Transfer Station Area of Potential Effects (APE) is 1.91 acres comprising TMK: (4) 5-3-001:017, a portion of TMK: (4) 5-3-001:002, and a portion of TMK:(4) 5-3-008:099 in Kalihikai Ahupuaʻa, Hanalei District. Located at 4380 Lele Road, the Hanapēpē refuse transfer station APE includes 3.35 acres of land occupying TMK: (4) 1-8-008:079, a portion of TMK: (4) 1-8-008:045, and a portion of TMK: (4) 1-8-008:999 in Hanapēpē Ahupuaʻa, Waimea District. Located at 5051 Kahi Road, the Kapaʻa refuse transfer station APE includes 3.97 acres of land occupying TMK: (4) 4-6-012:004, a portion of TMK: (4) 4-6-012:003, and a portion of TMK: (4) 4-6-012:110 within Kapaʻa Ahupuaʻa, Kawaihau District. Located at 3450 Ahukini Road adjacent to northwest portion of Līhuʻe Airport, the Līhuʻe refuse transfer station APE includes 3.35 acres of land occupying a portion of TMK: (4) 3-7-002:014, a portion of (4) 3-7-002:001, and a portion of (4) 3-7-002:016 in Hanamāʻulu Ahupuaʻa, Līhuʻe District.

Archaeological fieldwork at all four refuse transfer stations was conducted on December 2, 2020 by Robert B. Rechtman, Ph.D. and Cyrus Hulen. B.A. No historic properties were observed within any of the four APEs. As no historic properties were identified, in accordance with 36 CFR 800.4(d)(1), the Section 106 determination is *no historic properties affected*. With respect to HRS Chapter 6E-8 and pursuant to HAR §13-275-7, the effects determination is “no historic properties affected.”

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1. INTRODUCTION

At the request of Jacobs Engineering, Inc. on behalf of the County of Kauaʻi (landowner, Delegated Agency), ASM Affiliates (ASM) conducted archaeological investigations to support physical site improvements at four County of Kauaʻi refuse transfer stations (Figures 1, 2, 3, 4)—Hanalei Transfer Station, Hanapēpē Transfer Station, Kapaʻa Transfer Station, and Līhuʻe Transfer Station. The County of Kauaʻi intends to improve site conditions related to storm water conveyance and segregation of water flows to enhance compliance with the National Pollutant Discharge Elimination System (NPDES) regulations at these four transfer stations. The site improvements will generally address issues noted in past compliance inspections, reports, and other documentation; and will include improvements to concrete pad and tipping floor areas for the disposal operations, drop-off areas with roll-off and recycling bins, retaining walls, containment curbs and berms, truck wash areas, storage and queuing areas, installing pre-engineered metal canopies for covering the industrial operations at the facilities, storm water conveyance infrastructure incorporating low-impact development (LID) features, water supply lines, leachate-collection and storage facilities, equipment storage areas, and power for lighting and security features.

The County of Kauaʻi will be securing funding under the Clean Water State Revolving Fund (CWSRF) for design and construction of the site improvements thus creating a federal nexus for this project that requires compliance with Section 106 of the National Historic Preservation Act. As a county project, the development actions are also subject to review under Hawaiʻi Revised Statutes (HRS) Chapter 6E-8 and thus the current study was also prepared in compliance with Hawaiʻi Administrative Rules (HAR) 13§13–275 and performed in accordance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports as contained in HAR 13§13–276.

Respective to each transfer station APE, this report contains a description of the project area, a culture-historical background, a discussion of relevant prior archaeological studies, and the results of the current archaeological field investigations. The report concludes with Section 106 and HRS Chapter 6E statements of effect.

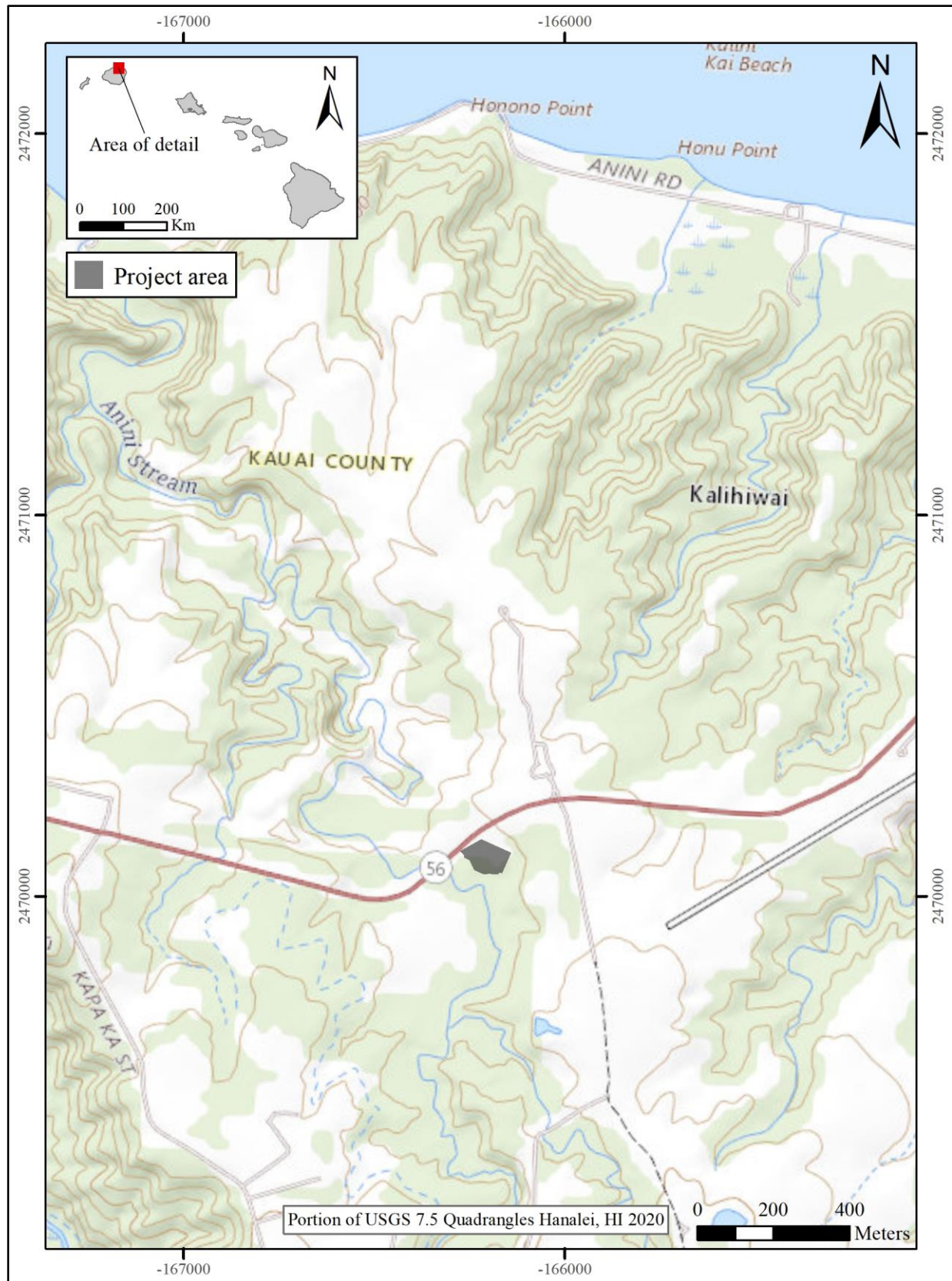


Figure 1. Hanalei refuse transfer station APE shaded in grey.

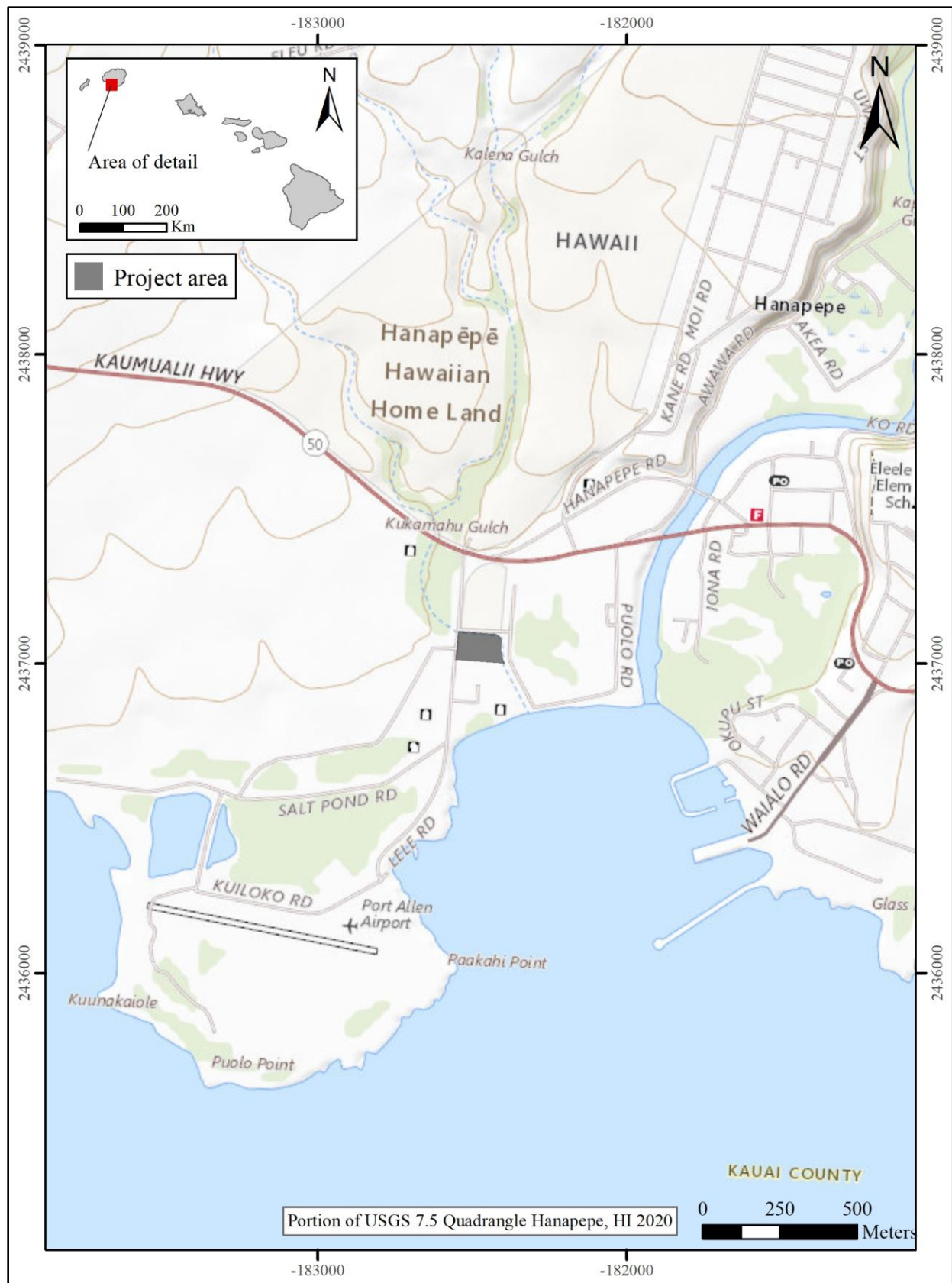


Figure 2. Hanapēpē refuse transfer station APE shaded in grey.

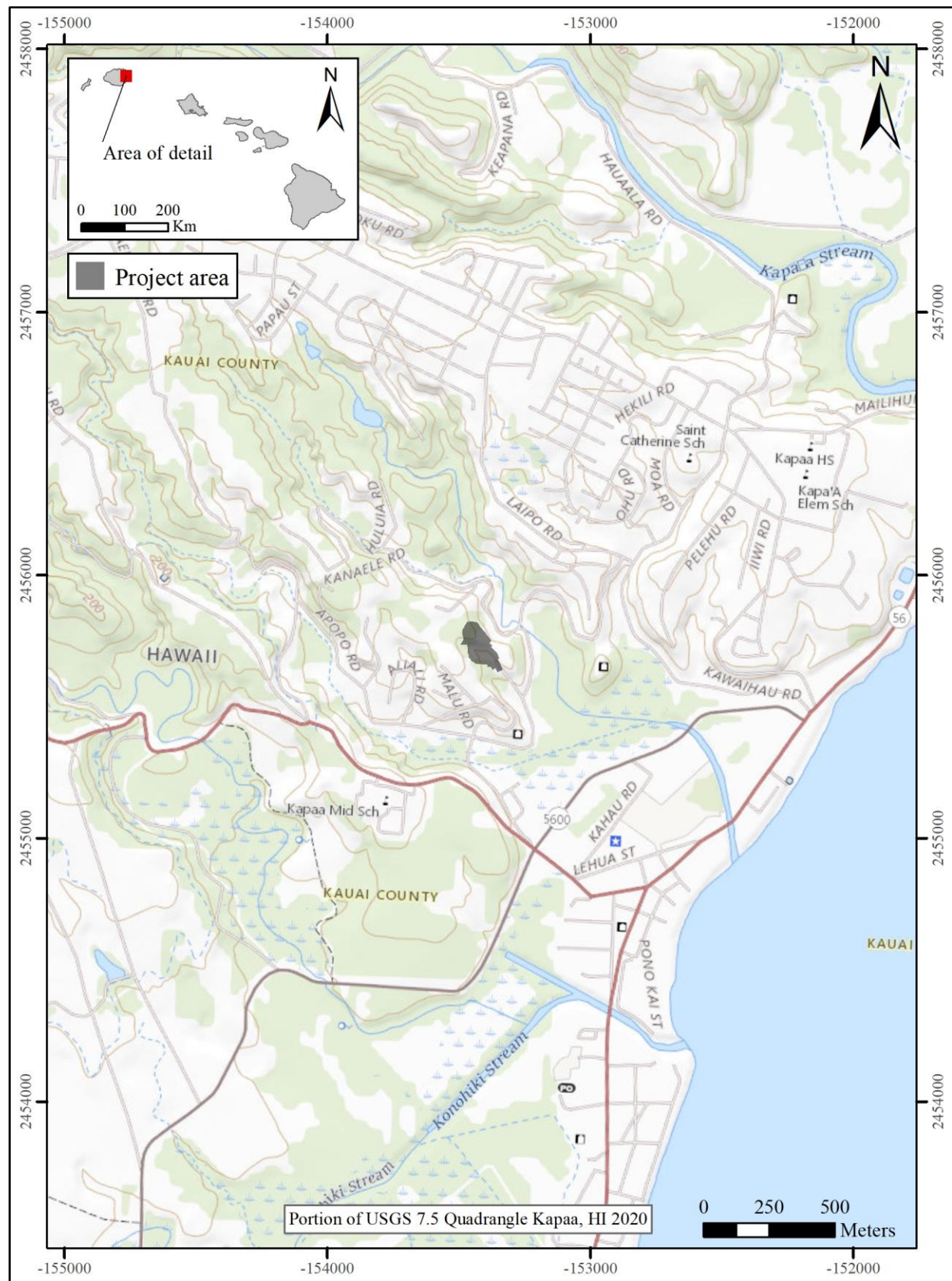


Figure 3. Kapa'a refuse transfer station APE shaded in grey.

Figure 4. Līhu‘e refuse transfer station APE shaded in grey.

Hanalei Refuse Transfer Station APE and Project Area Description

Soils within the APE consist of Makapili silty clay [McD] and Pooku silty clay [PmE] (Figure 6). This soil is classified as prime farmland, and a representative profile consists of a 12-inch brown silty clay surface layer, a 48-inch-thick subsoil consisting of reddish-brown and dark reddish-brown and yellowish-red clay loam and a silty clay that has sub-angular blocky structure, and a silty clay substratum. The soil properties are strongly acidic with moderately rapid permeability. Runoff is slow to rapid and erosion hazard is slight to moderate, increasing with slope, these soils are used for pasture and or sugarcane (USGS Soil Survey 2014). Vegetation only exists along the periphery of the APE as the current refuse operation occupies the center of the property with either paved or barren land (Figures 7 and 8). This vegetation consists of *hau* (*Hibiscus tiliaceous*), *kukui* (*Aleurites moluccana*), java plum (*Syzygium cumini*), *albisia* (*Falcataria moluccana*), Guinea grass (*Megathyrsus maximus*), giant swamp taro (*Cyrtosperma chamissonis*), and assorted weeds and vines (Figure 9).

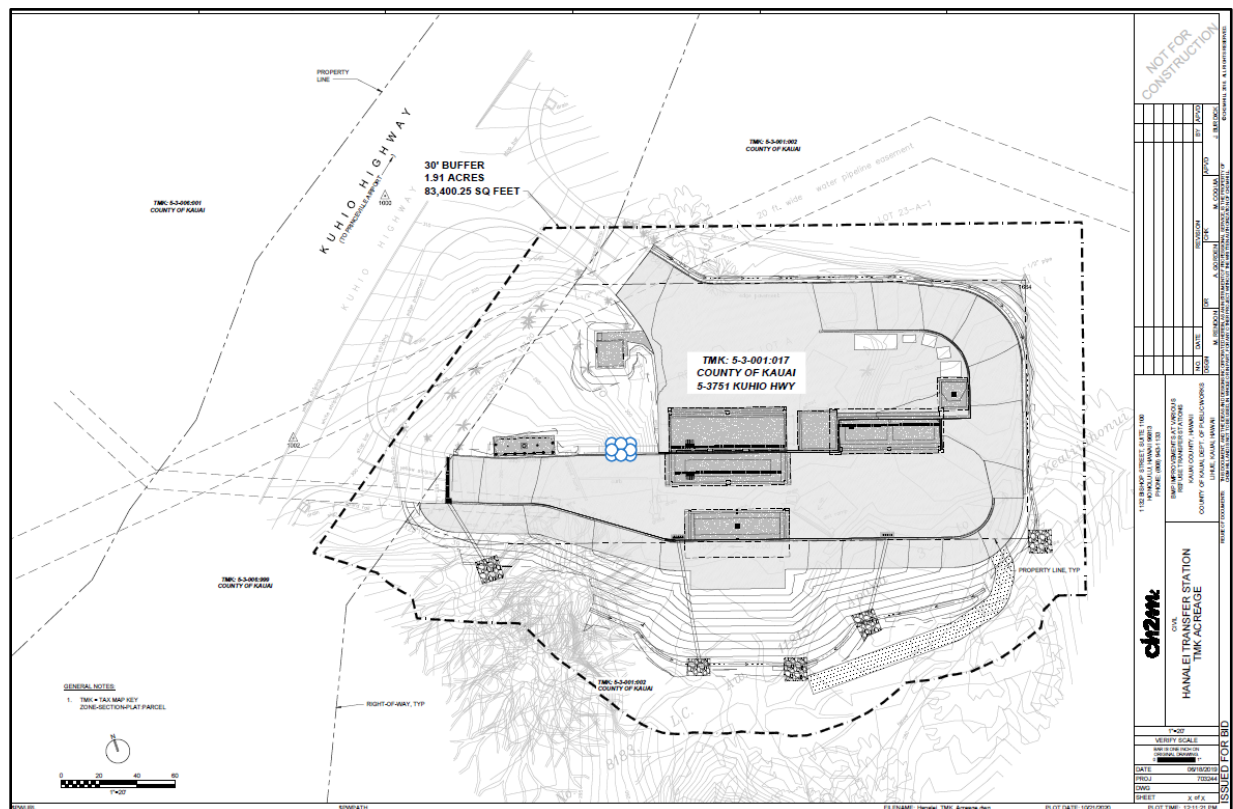


Figure 5. Hanalei refuse transfer station project site plan.

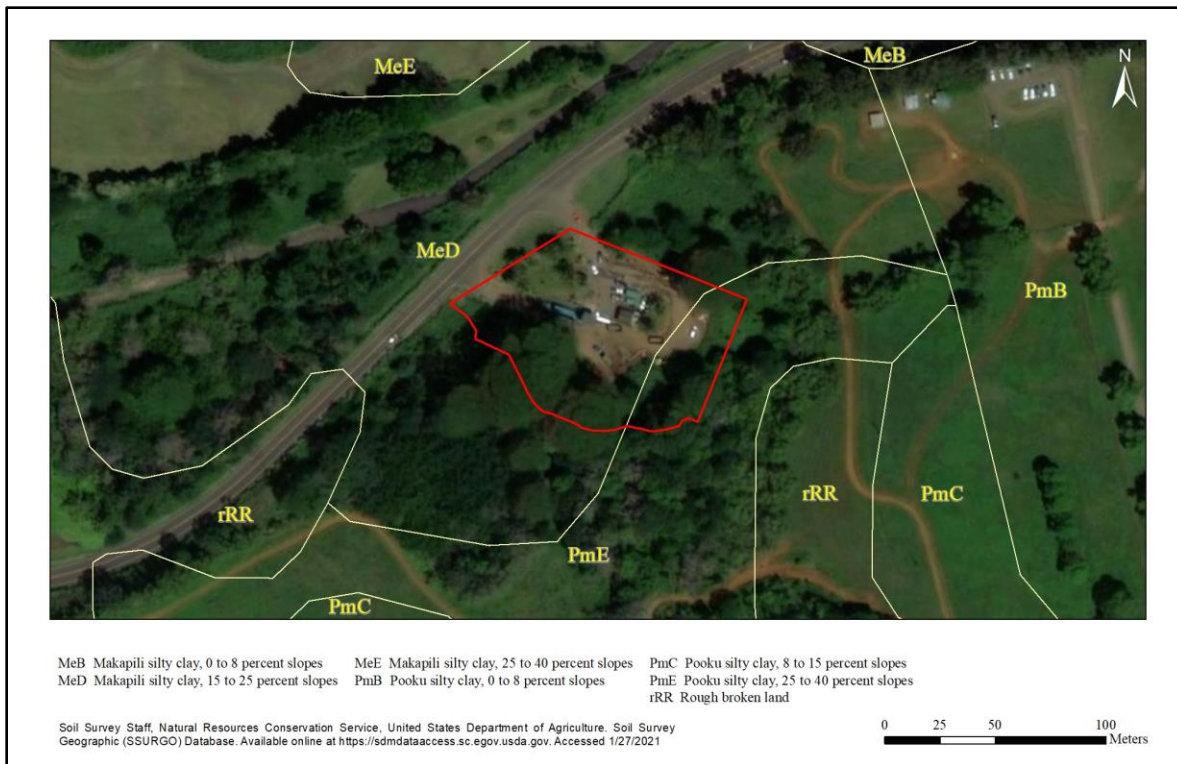


Figure 6. Soil Survey map with Hanalei refuse transfer station APE outlined in red.



Figure 7. Upper paved portion of the Hanalei refuse transfer station, view to the southeast.



Figure 8. Lower baren ground portion of the Hanalei refuse transfer station, view to the east.



Figure 9. Typical vegetation along the APE periphery, view to the south.

Hanapēpē Refuse Transfer Station APE and Project Area Description

Located at 4380 Lele Road, the Hanapēpē refuse transfer station APE includes 3.35 acres of land occupying TMK: (4) 1-8-008:079, a portion of TMK: (4) 1-8-008:045, and a portion of TMK: (4) 1-8-008:999 (Figure 10) in Hanapēpē Ahupuaʻa, Waimea District (see Figure 2). This area is bound to the west by Lele Road, to the east by a channelized drainage canal (Figure 11) carrying intermittent water flow from Kukamahu Gulch, to the north by an undeveloped “paper” roadway, and to the south by a county road maintenance baseyard (see Figure 10). The Hanapēpē Salt Ponds and coast are located roughly 0.16 miles (880 feet) to the south of the current APE. Elevation within the APE is approximately 6 meters (20 feet) above sea level. The mean annual rainfall for the area is 660 millimeters and annual average daily temperatures ranging between 71° and 78° Fahrenheit (Giambelluca et al. 2013).

One soil type Pakala Clay loam [PdA] is present within the APE (Figure 12). This soil can be prime farmland if irrigated as it is well drained with low run off. Given the fully developed nature APE for the current refuse operation (Figures 13 and 14), the only vegetation within the APE are various weeds and grasses (Figure 15).

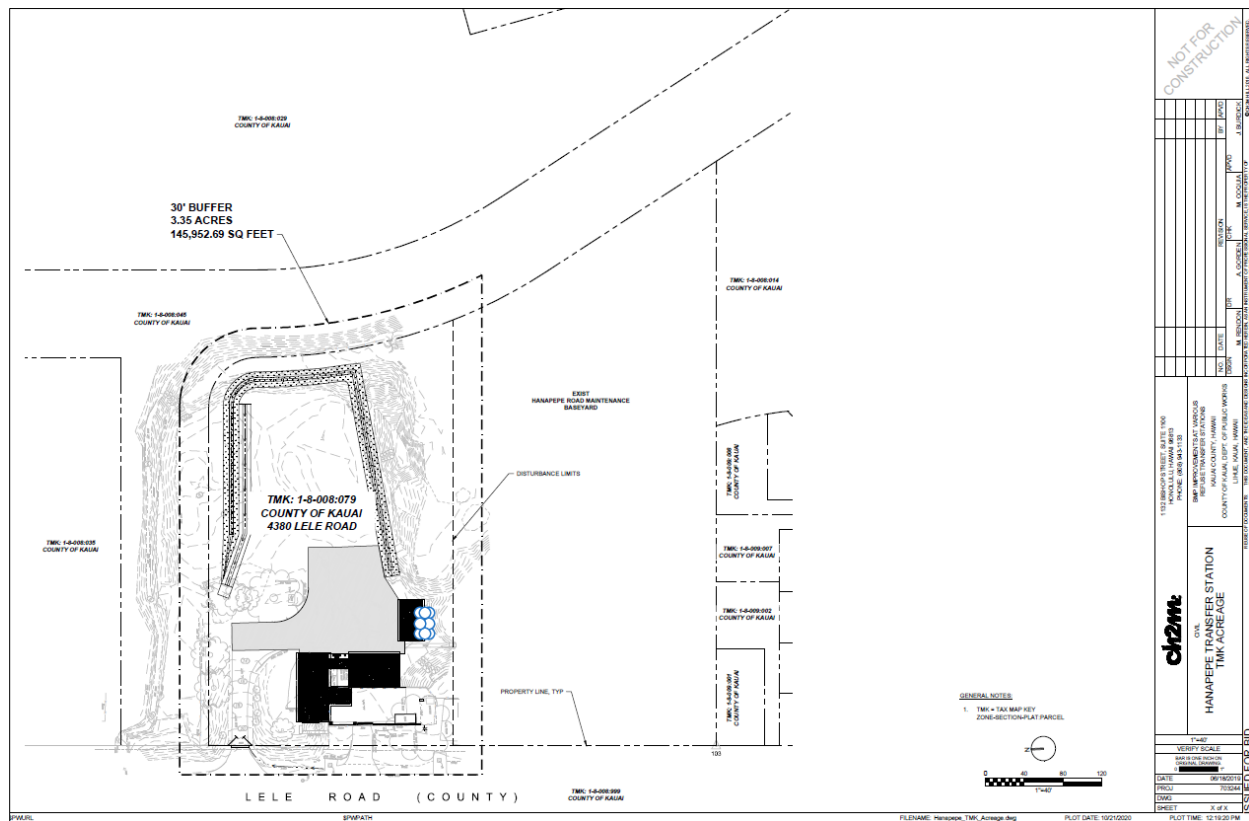


Figure 10. Hanapēpē refuse transfer station site plan.



Figure 11. Drainage canal along the eastern boundary of the APE, view to the north.



Figure 12. Soil Survey map with Hanapēpē refuse transfer station APE outlined in red.



Figure 13. Green waste section of the Hanapēpē refuse operation, view to the east.



Figure 14. Metal collection section of the Hanapēpē refuse operation, view to the south.



Figure 15. Typical vegetation cover within the Hanapēpē APE, view to the northeast.

Kapa‘a Refuse Transfer Station APE and Project Area Description

Located at 5051 Kahi Road, the Kapa‘a refuse transfer station APE includes 3.97 acres of land occupying TMK: (4) 4-6-012:004, a portion of TMK: (4) 4-6-012:003, and a portion of TMK: (4) 4-6-012:110 (Figure 16) within Kapa‘a Ahupua‘a, Kawaihau District (see Figure 3). This area is bound on all sides by currently unutilized portions of County of Kaua‘i-owned land (see Figure 16). The APE is situated roughly 1.2 kilometers from the coast above the traditional wetlands that fronted this part of the shore (see Figure 3). Elevation within the APE is ranges between 20 and 40 meters (70 and 130 feet) above sea level. The mean annual rainfall for the area is 1116 millimeters and annual average daily temperatures ranging between 71° and 78° Fahrenheit (Giambelluca et al. 2013).

One soil type Puhi Silty clay loam [PnE] is present within the APE (Figure 17). This soil has formed on 25-40 percent slopes making it poor farmland even if irrigated. Given the extent of the current refuse operation (Figures A, B, and C) and the past land use history of the APE as a “dump” site, the vegetation is sparse in the currently used areas with a mix of various weeds and grasses. Stands of *koa haole* (*Leucaena leucocephala*) and Guinea grass (*Megathyrsus maximus*) occupy the currently unused (Figure D), but formerly graded portions of the APE.

HrB Hanalei silty clay, deep water table, 0 to 6 percent slopes
 LhD Lihue silty clay, 15 to 25 percent slopes
 Mta Mokuleia clay loam, poorly drained variant
 PkB Pohakupu silty clay loam, 0 to 8 percent slopes, MLRA 158
 PnB Puhi silty clay loam, 3 to 8 percent slopes
 PnE Puhi silty clay loam, 25 to 40 percent slopes
 rRR Rough broken land

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture, Soil Survey Geographic (SSURGO) Database. Available online at <https://sdmdataaccess.sc.egov.usda.gov>. Accessed 1/27/2021

0 50 100 200
 Meters

13



Figure 18. Metal collection section of the Kapa'a refuse operation, view to the north.



Figure 19. Appliance and tire collection section of the Kapa'a refuse operation, view to the southeast.



Figure 20. Refuse container staging area of the Kapa'a refuse operation, view to the southwest.



Figure 21. Typical vegetation in the previously graded but currently unused section of the Kapa'a refuse operation, view to the west.

Līhu‘e Refuse Transfer Station APE and Project Area Description

Located at 3450 Ahukini Road adjacent to northwest portion of Līhu‘e Airport, the Līhu‘e refuse transfer station APE includes 3.35 acres of land occupying a portion of TMK: (4) 3-7-002:014, a portion of (4) 3-7-002:001, and a portion of (4) 3-7-002:016 (Figure 22) in Hanamā‘ulu Ahupua‘a, Līhu‘e District (see Figure 4). The APE comprises the northwestern half of TMK: (4) 3-7-002:014, with the southeastern half occupied by the Garden Isle Redemption Center. The remainder of the APE is surrounded by County of Kaua‘i-owned land. The APE is located roughly 200 meters south of Hanamā‘ulu Bay (see Figure 4), within a land area that was previously under intensive sugarcane cultivation; and presently the entire study area is a modified landscape with portions that have been graded, paved, and built up. The existing refuse operation (Figure 23) occupies the bulk of the APE and the periphery consists of mowed grass (Figure 24) and a drainage control feature (Figure 25). There is a modern warehouse building (Figure 26) at the extreme western corner of the APE.

Elevation within the APE ranges from 75 to 94 feet (23 to 29 meters) above sea level. The annual average rainfall in the APE vicinity is 997 millimeters with an annual average daily temperature range between 70° and 78° Fahrenheit (Giambelluca et al. 2013). Soil within the APE is classified as Lihue Silty Clay (LhB) (Figure 27), which was historically used for intensive cultivation. Vegetation within the APE is limited to non-native grasses, ornamental bushes, and palms (Figure 28).

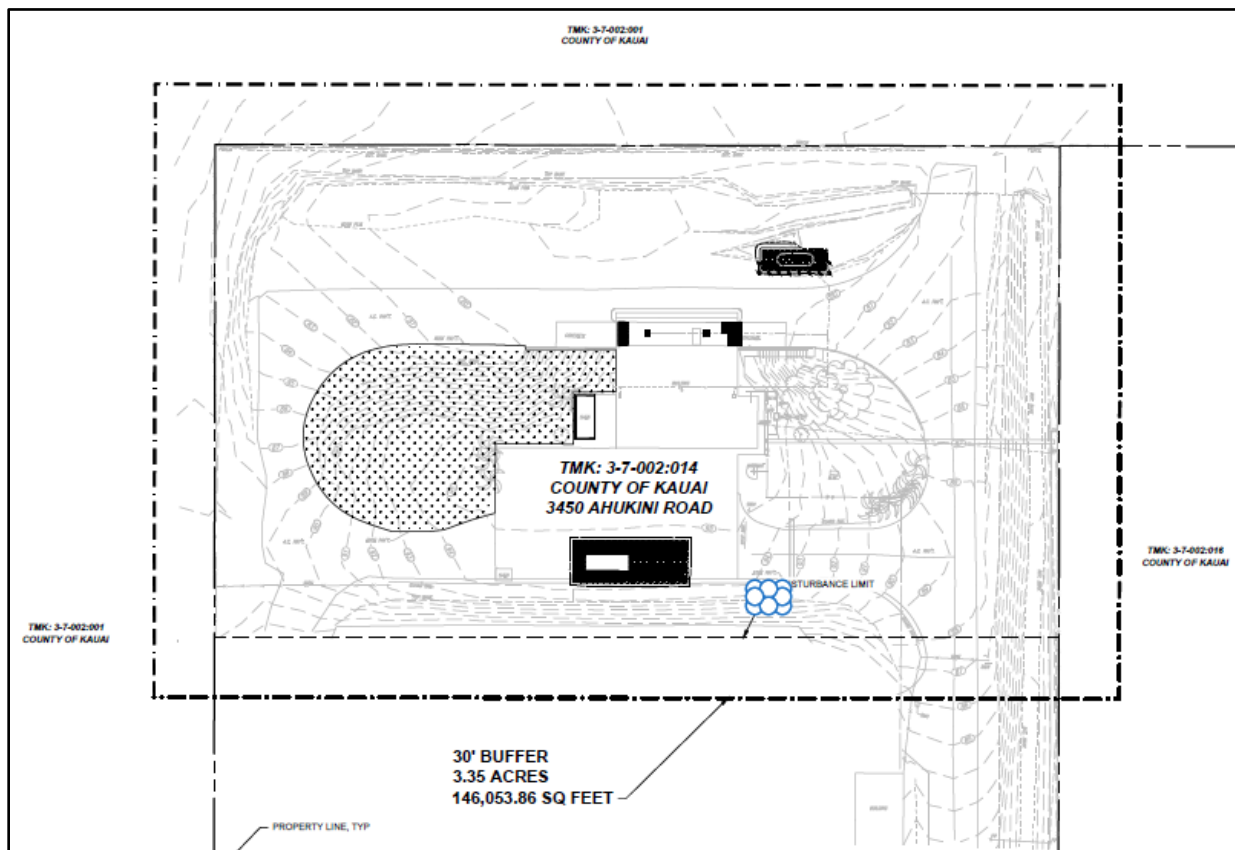


Figure 22. The Līhu‘e refuse transfer station site plan.



Figure 23. Green waste and main refuse disposal areas at the Līhu'e transfer station, view to the east.



Figure 24. Mowed western border of the Līhu'e refuse station APE, view to the northeast.



Figure 25. Drainage feature toward the northeastern side of the Kapa‘a refuse station APE, view to the northwest.



Figure 26. Modern building at the western corner of the Kapa‘a refuse station APE, view to the west.

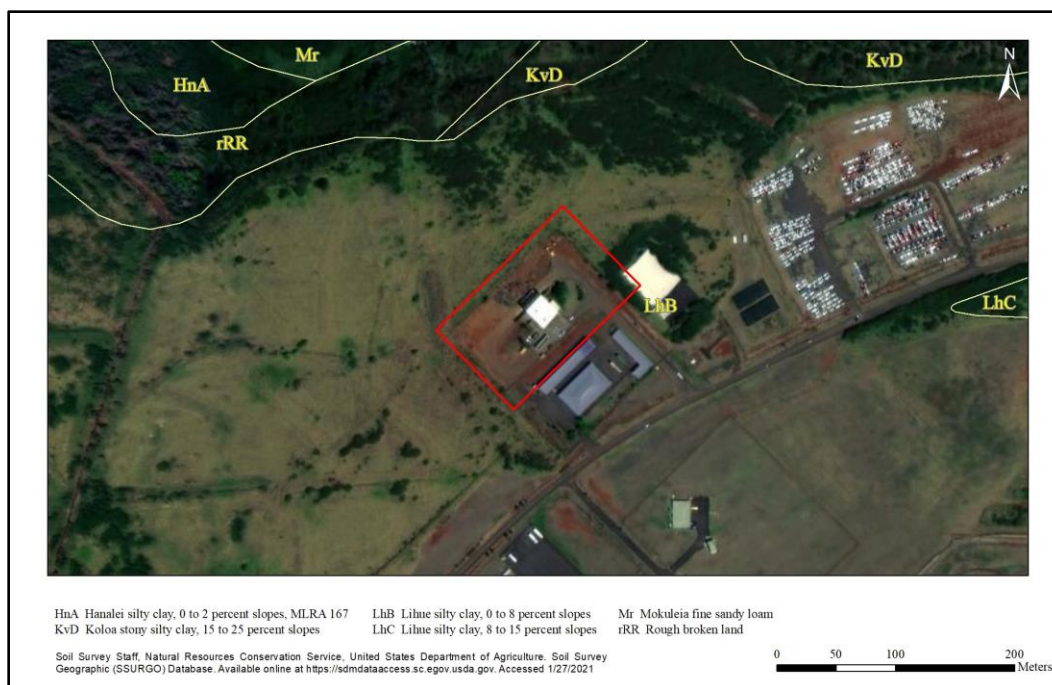


Figure 27. Soil map with Lihue refuse transfer station APE outlined in red.

2. BACKGROUND

This section of the report contains a generalized culture-historical background for Kaua'i, as well as for each of the *ahupua'a* where the four APE are located. A synthesis of prior archaeological, cultural, and historical research relevant to each APE is also presented. This information facilitates an understanding of the significance of the APE locations, is used to generate a set of expectations regarding the nature of the cultural resources that might be encountered within the four APEs, and to establish an analytical basis for the assessment of the significance of any such resources.

CULTURE-HISTORICAL CONTEXT

Early Hawaiian Settlement Patterns of Kaua'i

While the question of the timing of the first settlement of Hawai'i by Polynesians remains unanswered, several theories have been offered that are derived from various sources of information (i.e., genealogical, oral-historical, mythological, radiometric); but none of these theories is today universally accepted (Kirch 2011). For many years, researchers have proposed that early Polynesian settlement voyages between *Kahiki* (the ancestral homelands of the Hawaiian gods and people) and Hawai'i were underway by A.D. 300, with long distance voyages occurring fairly regularly through at least the thirteenth century. More recent re-evaluation of the data, however, seems to indicate that there is no concrete archaeological evidence for pre-A.D. 1000 claims, rather Kirch (2011) and others (Athens et al. 2014; Wilmschurst et al. 2011) have argued that Polynesians may not have arrived at the Hawaiian Islands until at least A.D. 1000, but expanded rapidly thereafter. The peoples who settled the Archipelago developed a uniquely Hawaiian culture.

The initial settlement in Hawai'i is believed to have occurred from the southern Marquesas Islands. In these early times, Hawai'i's inhabitants were primarily engaged in subsistence level agriculture and fishing (Handy et al. 1991). This was a period of great exploitation and environmental modification, when early Hawaiian farmers developed new subsistence strategies by adapting their familiar patterns and traditional tools to their new environment (Kirch 1984; Pogue 1978). Their ancient and ingrained philosophy of life tied them to their environment and kept order, which was further assured by the conical clan principle of genealogical seniority (Kirch 1984). According to Fornander (1969), the Hawaiians brought from their homeland certain universal Polynesian customs and belief such as major gods that include Kāne, Kū, and Lono; the *kapu* system of law and order; cities of refuge; the *'aumakua* concept; and the concept of *mana* (Fornander 1969).

2. Background

In 1893, Dr. Nathaniel Emerson made the following observations about the link between Kaua'i and southern Polynesia:

It is a matter of observation that only on the island of Kauai both the special features of its spoken language and the character of its myths and legends indicate a closer relationship to the groups of the southern Pacific, to which the Hawaiian people owe their origin, than do those of the other islands of the Hawaiian group. (Joesting 1984)

Initial permanent settlements in the islands were established at sheltered bays with access to fresh water and marine resources. Communities shared extended familial relations and there was an occupational focus on the collection of marine resources. Over a period of several centuries the areas with the richest natural resources became populated and perhaps even crowded, and there was an increasing separation of the chiefly class from the common people. Land was considered the property of the king or ali'i 'ai moku (the ali'i, or chief, who eats the island/district), which he held in trust for the gods. The title of ali'i 'ai moku ensured rights and responsibilities to the land but did not confer absolute ownership. The king kept the parcels he wanted, his higher chiefs received large parcels from him and, in turn, distributed smaller parcels to lesser chiefs. The maka'āinana (commoners) worked the individual plots of land.

As the environment reached its maximum carrying capacity, the result was social stress, hostility, and war between neighboring groups (Kirch 1985). Soon, large areas of Hawai'i were controlled by a few powerful chiefs.

As time passed, a uniquely Hawaiian culture developed. The portable artifacts found in archaeological sites of this period reflect not only an evolution of the traditional tools, but some distinctly Hawaiian inventions. The adze (*ko'i*) evolved from the typical Polynesian variations of plano-convex, trapezoidal, and reverse-triangular cross-section to a very standard Hawaiian rectangular quadrangular tanged adze. A few areas in Hawai'i produced quality basalt for adze production. Mauna Kea, on the island of Hawai'i, possessed a well-known adze quarry. The two-piece fishhook and the octopus-lure breadloaf sinker are Hawaiian inventions of this period, as are 'ulu *maika* stones and *lei niho palaoa*. The latter was a status item worn by those of high rank, indicating a trend toward greater status differentiation (Kirch 1985). As population continued to expand so did social stratification, which was accompanied by major socioeconomic changes and intensive land modification. Most of the ecologically favorable zones of the windward and coastal regions of all major islands were settled and the more marginal leeward areas were being developed. Additional migrations to Hawai'i occurred from Tahiti in the Society Islands. Rosendahl (1972) has proposed that settlement at this time was related to seasonal, recurrent occupation in which coastal sites were occupied in the summer to exploit marine resources, and upland sites were occupied during the winter months, with a focus on agriculture (Rosendahl 1972). An increasing reliance on agricultural products may have caused a shift in social networks as well; as Hommon (1976) argues, kinship links between coastal settlements disintegrated as those links within the *mauka-makai* settlements expanded to accommodate exchange of agricultural products for marine resources (Hommon 1976). This shift is believed to have resulted in the establishment of the *ahupua'a* system sometime during the A.D. 1400s (Kirch 1985), adding another component to an already well-stratified society. The implications of this model include a shift in residential patterns from seasonal, temporary occupation, to permanent dispersed occupation of both coastal and upland areas (Kirch, 1985).

By this time (A.D. 1400s) the island of Kaua'i appears to have been divided into six traditional districts or *moku*, and the *moku* were further divided into distinct land units known as *ahupua'a*. Kaua'i consisted of the six *moku* of Kona, Puna, Ko'olau, Halele'a, Napali, and Waimea. The *ahupua'a* became the equivalent of a local community, with its own social, economic, and political significance. *Ahupua'a* were ruled by *ali'i 'ai ahupua'a*; who, for the most part, had complete autonomy over this generally economically self-supporting piece of land, which was managed by a *konohiki*. The *ali'i 'ai ahupua'a* in turn answered to an *ali'i 'ai moku*, a higher chief who ruled over the *moku* and claimed the abundance of the entire district. Thus, *ahupua'a* resources supported not only the *maka'āinana* (commoners) and *'ohana* (extended families) who lived on the land, but also provided support to the ruling class of higher chiefs and ultimately the crown. Rather than denoting ownership of the lands by ali'i, the *ahupua'a* boundaries signified a trusteeship between the caretakers of the land (*konohiki*), designated by the ali'i, and *Nā Akua*, the natural elements acknowledged and revered by Hawaiians (Handy and Handy 1972). *Ahupua'a* were ideally wedge or pie-shaped, incorporating all of the eco-zones from the mountains to the sea and for several hundred yards beyond the shore, assuring a diverse subsistence resource base (Hommon 1986). The ali'i and the *maka'āinana* (commoners) were not confined to the boundaries of an *ahupua'a*; when there was a perceived need, they also shared with their neighbor *ahupua'a 'ohana* (Hono-ko-hau 1974). The *ahupua'a* were further divided into smaller sections such as 'ili, *mo'o'aina*, *paukū'aina*, *kīhāpai*, *kō'ele*, *hakuone*, and *kuakua* (Hommon 1986) (Pogue 1978). The chiefs of these land

units gave their allegiance to a territorial chief or *mō'ī* (king). *Heiau* building flourished as religion became more complex and embedded in a sociopolitical climate of territorial competition. Monumental architecture, such as *heiau*, “played a key role as visual markers of chiefly dominance” (Kirch 1990:206).

The Hawaiian economy was based on agricultural production and marine exploitation, as well as raising livestock and collecting wild plants and birds. Extended household groups settled in various *ahupua'a*. During pre-Contact times, there were primarily two types of agriculture, wetland, and dry land, both of which were dependent upon geography and physiography. River valleys provided ideal conditions for wetland *kalo* (*Colocasia esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as *kō* (sugar cane) and *mai'a* (banana), were also grown and, where appropriate, such crops as *'uala* (sweet potato) and *'ulu* (breadfruit) were cultivated. This was the typical agricultural pattern seen during traditional times on all the Hawaiian Islands (Kirch 1985, 1992). Many Hawaiian river valleys featured cultivation in lower valley sections and on bends in the stream where alluvial terraces could be modified to take advantage of the stream flow (Earle 1978; Kirch 1992).

Kaua'i After European Contact

The Island of Kaua'i was the first of the Hawaiian Islands to be reached by Europeans, which occurred in 1778 when Captain James Cook's ships the *Discovery* and the *Resolution* anchored at Waimea. As previously mentioned, in the years leading up to the first contact with Europeans, the Hawaiian Islands were under the control of various *mō'ī*. These high-ranking chiefs acted as kings or sovereigns of the different *moku* (districts) and in some cases of entire islands. Interisland and intra-island warfare resulted in tremendous loss of life and power shifts across the island chain. A decade after Hawai'i's first contact with the Western world, Hawaiians began to acquire firearms and cannons, which resulted in even greater casualties.

In 1790, Kamehameha I was still battling for complete control of Hawai'i Island. During this time, he invaded Maui, Lāna'i, and Moloka'i, wresting control from Kahekili, then king of Maui and O'ahu. In 1791, Kahekili's half-brother Ka'eo (Ka'eokūlani) was king of Kaua'i and joined Kahekili in successfully reclaiming the islands of Maui, Lāna'i, and Moloka'i. Later that same year, Ka'eo and Kahekili tried to invade the island of Hawai'i and were defeated by Kamehameha in a sea battle known as “the battle of the red-mouthed guns” (Joesting 1984:55). Shortly thereafter, Kamehameha was able to unite the island of Hawai'i under his rule, upon the sacrificial death of his greatest rival Keoua, the high chief of Ka'ū. Kahekili died on Maui in 1794. Soon after, Ka'eo stopped in at O'ahu on his way back to Kaua'i and was killed at the hands of his own forces and foreign reinforcements as he attempted to suppress a rebellion. With Ka'eo and Kahekili gone, Kamehameha was able to conquer Maui, Moloka'i, Lāna'i and O'ahu by October of 1795, and set his sights set on the last holdouts of Kaua'i and Ni'ihau.

At this time, the island of Kaua'i was host to its own civil war, which had erupted upon the death of Ka'eo because his son Keawe “decided to ignore his father's wishes that Kaumuali'i become king” (Joesting 1984:58). As a result of this feud, the brothers fought bitterly and by July of 1796, Keawe successfully defeated Kaumuali'i. Rather than kill Kaumuali'i, Keawe kept him under house arrest, but Keawe died soon after taking him prisoner. As a result, Kaua'i and Ni'ihau came under the rule of Kaumuali'i, a mere teenager at the time.

In April 1796, while Kaumuali'i was still his brother's prisoner, Kamehameha I had mounted a failed invasion of Kaua'i. Kamehameha I and his troops fell prey to the strong currents and dangerous winds of the Ka'ie'ie Waho Channel (between O'ahu and Kaua'i) and were forced to turn back to O'ahu before they even reached their target. About eight years later, Kamehameha I prepared for a second invasion of Kaua'i. However, an epidemic swept through O'ahu, which depleted his ranks and claimed the lives of his most trusted advisors before they had a chance to set sail across the channel, thereby foiling another invasion attempt (Joesting 1984). Kamehameha I and the young king endured five years of fruitless negotiations and Kaumuali'i finally agreed to meet Kamehameha face to face in Honolulu in 1810. As a result of this meeting, Kaumuali'i retained control of the Kaua'i by pledging his allegiance to Kamehameha I; although Kaua'i had officially become part of Kamehameha's kingdom.

This arrangement lasted until a few years after the death of Kamehameha I (circa 1819). In the meantime, the first missionaries arrived on Kaua'i via the ship *Thaddeus* sent by the American Board of Commissioners for Foreign Missions (ABCFM) in 1820 from Boston Massachusetts. Also, on board the *Thaddeus* were four young Hawaiian men who had been educated at the Foreign Mission School in Cornwall Connecticut. Among these young Hawaiians was Kaumuali'i's son George, who wished to be reunited with his father, King Kaumuali'i, on Kaua'i (Joesting 1984). By the time they arrived at the island of Hawai'i in April of 1820, Kamehameha I had died and the traditional *kapu* system had been discarded. Some of the contingent stayed at Kailua-Kona on Hawai'i Island while the rest set up mission headquarters in Honolulu. George Kaumuali'i and his missionary escorts Ruggles and Whitney anchored at

Waimea, Kauaʻi on May 3, 1820. As a result of his joyous reunion with his son and the young Prince's accounts of the missionaries' kindness, Kaumualiʻi extended an open invitation with full support for his guests and their families to settle in Kauaʻi. Furthermore, Kaumualiʻi pledged to build schoolhouses, meeting houses and observe the Sabbath (Joesting 1984).

In 1821, Kamehameha's son Liholiho (Kamehameha II) kidnapped Kaumualiʻi from Kauaʻi and took him to Oʻahu. Within days, Kaumualiʻi was forced to marry Kamehameha I's widow Kaʻahumanu. A few days after that, Kaʻahumanu also took Kaumualiʻi's son Kealiʻiahonui as her husband, thereby sealing the alliance between the leeward and windward islands (Joesting 1984). Kaumualiʻi, the last independent king of Kauaʻi, died in 1824 in Honolulu, having never returned to Kauaʻi after Liholiho lured him away (Donohugh 2001). According to most accounts, Kaumualiʻi was remembered favorably by *kamaʻāina* and foreigners alike. Upon Kaumualiʻi's death, Kauaʻi became divided over whether to be loyal to Kamehameha II and the windward chiefs who had taken it upon themselves to fill in for the late king of Kauaʻi; or pursue the independence they had enjoyed in the early days under Kaumualiʻi's rule (Donohugh). After Kaumualiʻi's death, Keeaumoku, the first appointed governor, died shortly after his appointment. Keeaumoku was replaced by Kahalaia (Joesting 1984). However, because of the mounting tensions throughout Kauaʻi, Kaʻahumanu's cousin Kalanimoku, the prime minister and treasurer of the kingdom, ventured to Waimea, Kauaʻi on August 1, 1824, to diffuse the situation (Del Piano 2009).

To reclaim sovereignty for Kauaʻi and Niʻihau, on August 8, 1824, a small group of rebels that included Kaumualiʻi's son George (Humehume) mounted a failed uprising against the Hawaiian presence at the Russian Fort at Waimea (Del Piano 2009; Joesting 1984). Prince George and the other insurgents were forced to retreat and sought refuge in Hanapēpē Valley. In response, some Kauaʻi natives armed themselves to fight the rebels and Kalanimoku called in reinforcements from Oʻahu and Maui. On August 20, 1824, experienced troops armed with muskets arrived in Kauaʻi and defeated Humehume and his small group of rebel supporters in the battle of Hanapēpē-Wahiawa. The rebels who survived the battle, fled; however, many of them were later caught and held captive. Humehume was among these men and was brought before Kalanimoku, who spared the prince's life (Del Piano 2009). The repercussions of this decisive battle resulted in the realization of Kamehameha I's aspirations for the unification of all the Hawaiian Islands under one rule, albeit five years after his death.

Various historical accounts of the battle of Hanapēpē-Wahiawa and its aftermath describe the extreme brutality meted out by the invaders, which included violent acts against unarmed women and children (Joesting 1984). The invaders looted the island, stripped the chiefs of their lands, and deported them to Hawaiʻi, Oʻahu, and Maui. Kaʻahumanu continued to influence Hawaiian history during this time. She had assumed control over the Hawaiian kingdom since 1823 when her son Liholiho had set sail for England, and upon notification of Liholiho's death in 1825, she became the self-appointed regent of Hawaiʻi. After Kaumualiʻi's death, Kaʻahumanu redistributed many of the Kauaʻi chiefs' lands to members of the royal family (descendants of Kamehameha), or gave them out as rewards to favored court advisors and proven warriors, all of whom acted as absentee landlords because they resided on other islands (Joesting 1984). In his history of Kauaʻi, Joesting (1984) opines that the motives for these vengeful attacks upon Kauaʻi after Kaumualiʻi's death had been building for generations. Some of the windward island rulers resented the power inherent in the birthright of the kings of Kauaʻi and likely held grudges from earlier invasions of the windward islands; while others may have felt that they had unfinished business after Kamehameha I's two failed invasion attempts. In addition, some of the windward fighters may have gone to Kauaʻi to root out the missionary presence that Kaumualiʻi had so warmly welcomed there. The first mission in Kauaʻi was located at Waimea and in 1835 a second mission station was opened in Kōloa beginning the spread of Christianity throughout Kauaʻi.

As missionaries and foreigners made Kauaʻi their home, their western influences prevailed upon the native Hawaiian a new market system economy. Beginning in the early 1800s, Hawaiʻi shifted from a traditional self-sustaining, subsistence economy based on agricultural production to an economy based on the sale of goods and services. This progression affected the society as a whole and caused the population to move away from villages and valleys and settle in towns and seaports (Wilcox 1996). The sandalwood trade with the Orient (ca. 1811-1835), visits from whaling ships (ca. 1819-1861), the California Gold Rush (ca. 1849-1859), and commercial sugar cultivation (ca. 1849-1986) had profound influences on the landscape and people in the vicinities of all four of the current APEs.

Kaua‘i and the *Māhele* ‘Āina of 1848

By the mid-19th-century, the Hawaiian Kingdom was an established center of commerce and trade in the Pacific, recognized internationally by the United States and other nations in the Pacific and Europe (Sai 2011). As Hawaiian political elite sought ways to modernize the burgeoning Kingdom, and as more Westerners settled in the Hawaiian Islands, major socioeconomic and political changes took place, including the formal adoption of a Hawaiian constitution by 1840, the change in governance from an absolute monarchy to a constitutional monarchy, and the shift towards a Euro-American model of private land ownership. This change in land governance was partially informed by ex-missionaries and Euro-American businessmen in the islands who were generally hesitant to enter business deals on leasehold lands that could be revoked from them at any time. *Mō‘ī* (Ruler) Kamehameha III, through intense deliberations with his high-ranking chiefs and political advisors, separated and defined the ownership of all lands in the Kingdom (King n.d.). They decided that three classes of people each had one-third vested rights to the lands of Hawai‘i: the *Mō‘ī*, the *ali‘i* and *konohiki*, and the native tenants (*hoa‘āina*). In 1846, King Kamehameha III formed the Board of Commissioners to Quiet Land Titles (more commonly known as the Land Commission) to adopt guiding principles and procedures for dividing the lands, grant land titles, and act as a court of record to investigate and ultimately award or reject all claims brought before them (Bailey in Commissioner of Public Lands 1929). All land claims, whether by chiefs for an entire *ahupua‘a* or *‘ili kūpono* (nearly independent *‘ili* land division within an *ahupua‘a*, that paid tribute to the ruling chief and not to the chief of the *ahupua‘a*), or by *hoa‘āina* for their house lots and gardens, had to be filed with the Land Commission within two years of the effective date of the Act (February 14, 1846) to be considered. This deadline was extended for chiefs and *konohiki*, but not for native tenants (Soehren 2005).

The King and some 245 chiefs spent nearly two years trying unsuccessfully to divide all the lands of Hawai‘i amongst themselves before the whole matter was referred to the Privy Council on December 18, 1847 (King n.d.; Kuykendall 1938). Once Kamehameha III and his chiefs accepted the principles of the Privy Council, the *Māhele* ‘Āina (Land Division) was completed in just forty days (on March 7, 1848). The names of nearly all of the *ahupua‘a* and *‘ili kūpono* of the Hawaiian Islands, as well as the names of the chiefs who claimed them, were recorded in the *Buke Māhele* (*Māhele* Book) (Buke Māhele 1848; Soehren 2005). As this process unfolded, King Kamehameha III, who received roughly one-third of the lands of Hawai‘i, realized the importance of setting aside public lands that could be sold to raise money for the government and also purchased for fee simple title by his subjects. Accordingly, the day after the division when the name of the last chief was recorded in the *Buke Māhele*, the King commuted about two-thirds of the lands awarded to him to the government (King n.d.). Unlike Kamehameha III, the chiefs and *konohiki* were required to present their claims to the Land Commission to receive their Land Commission Awards (LCAw.). The chiefs who participated in the *Māhele* were also required to provide to the government commutations of a portion of their lands in order to receive a Royal Patent giving them title to their remaining lands. The lands surrendered to the government by the King and chiefs became known as “Government Land.” The lands personally retained by the King became known as “Crown Land.” Lastly, the lands received by the chiefs became known as “Konohiki Land” (Chinen 1958:vii; 1961:13). Lots awarded to *hoa‘āina* became known as *kuleana*. To expedite the work of the Land Commission, all lands awarded during the *Māhele* were identified by name only, with the understanding that the ancient boundaries would prevail until the lands could be formally surveyed.

Although no records exist of the names of individuals who had their land stripped from them after the conquest of Kaua‘i in 1824, the *Māhele* records provide data on those who claimed possession of the lands in ca. 1847 (Joesting 1984). As previously mentioned, many lands in Kaua‘i were given to individuals related in some way to the Kamehameha dynasty. In addition, the names of two governors of Kaua‘i, Kaikio‘ewa and Paul Kanoa appear often in the *Māhele* records; as does the name Kalanimoku, sometimes spelled Kalaimoku, which translates as “Counselor, prime minister, high official” (Pukui and Elbert 1986:121).

Following the *Māhele*, the Hawaiian kingdom initiated a grant program to encourage more native tenants to engage in fee-simple ownership of parcels of land. These parcels consisted primarily of Government lands—those lands given outright by the King or commuted to the Government by the *ali‘i* in lieu of paying the commutation fees on the parcels awarded them during the *Māhele*. These land grants were quite large, ranging in size from approximately ten acres to many hundreds of acres. When the sales were agreed upon, Royal Patents were issued and recorded following a numerical system that remains in use today. In 1862, the Commission of Boundaries (Boundary Commission) was established to legally set the boundaries of the *ahupua‘a* that had been awarded (not retained by or commuted to the government) as a part of the *Māhele*. The primary informants for the boundary descriptions were old native residents of the lands, many of which had also been claimants for *kuleana* during the *Māhele*.

Kaua'i General Patterns of Industry into the Modern Era

Whaling, trade, and commerce flourished between 1830-1861 in communities and settlements along Kaua'i's southwest coast (Joesting 1984). Rice farming became established on Kaua'i between the 1850s and 1860s. The expansive growth of the commercial cultivation sugarcane and pineapple throughout the island transformed settlement and land use. The sugar industry began on Kaua'i in 1835 and lasted through 1986, drastically altering the landscape, economy, and settlement patterns across the island.

APE-SPECIFIC CULTURE-HISTORICAL CONTEXTS

Specific culture-historical information is presented below for each of the APE *ahupua'a*.

Hanalei Refuse Transfer Station: Kalihikai Ahupua'a

The Hanalei refuse transfer station is located in Kalihikai Ahupua'a in the traditional district of Halele'a (modern district of Hanalei). There are relatively few legendary references to Kalihikai Ahupua'a, and when it is mentioned, it is only in passing. For example, Fornander's (Fornander 1919:224-225) recounting of the Legend of Kapunohu describes how Kapunohu became ruling chief of Kaua'i by throwing a spear from Kōloa through the ridge at Anahola creating a perforation and finally slowing as it passed Kalihikai and falling to ground at Hanalei. The inland-most boundary of the *ahupua'a* at a mountain peak called Kapaka where Kalihikai and the *ahupua'a* that flank it share a boundary, is also known to be the location of a traditional *heiau* of the same name. Kapaka Heiau was described by Thrum (1906:42) as "[a] paved open platform heiau without walls; stones set edgewise traversing through. Kane its deity. Said to have had connection with Kapinao [Heiau] at Waiakalua in its working." The uplands of Kalihikai were also known for their extensive groves of *hala* (*Pandanus tectorius*) as documented historically, which were likely an important resource for resident during Precontact times. Alexander described these groves on approaching Hanalei in 1849, "[f]ive more miles of riding through woods of hala, brought us to the tip of the hill that overlooks Hanalei Valley . . ." (1991:124).

In *Native Planters in Old Hawaii: Their Life, Lore, and Environment*, Handy and Handy (Handy and Handy 1972:417-418) make small reference to Kalihikai:

East of Hanalei are two small *ahupua'a*, Kalihi-kai and Kalihi-wai, both of which had quite extensive *lo'i* areas neat the sea. There were *lo'i* back along main streams and side streams, but both valleys are shallow. Actually the stream flow from both valleys is diverted to Kilauea, the adjacent *ahupua'a* in the *moku* of Ko'olau.

Traditionally, Kalihikai was important agriculturally as its narrow gulches brought fresh water from three small streams to the long, flat alluvial lands *makai* of the current APE. Earle (Earle 1978:149) identified five pond field irrigation systems in the coastal portion of Kalihikai that were used from Precontact times into the 1850, which he documented both archaeologically and through *Māhele* records.

During the *Māhele*, on February 8, 1848 the *ali'i* Aaron Keali'iahonui, son of Kaumuali'i, the former ruling chief of Kaua'i laid claim to three lands, one of which included Kalihikai Ahupua'a on Kaua'i (Buke Māhele 1848). Keali'iahonui's claim was confirmed as 'āpana (parcel) 3 of LCAw. 11215 which encompassed 2,362 acres (excluding any lands that would be awarded to any *hoa'āina*) (Commissioner of Public Lands 1929). Keali'iahonui died on June 23, 1848 and he never officially received a royal patent for his claim and the land matter went unresolved for many decades.

Within Kalihikai, some twenty-eight *kuleana* were awarded to thirteen *hoa'āina*. The majority of these claims were for parcels that did not exceed 1.5 acres, excepting one that was for roughly 8 acres awarded to Kahakamoku. Twelve of the *hoa'āina* had received between two to three parcels. The awarded parcels were scattered along the coast and with agricultural lots extended *mauka* along tributaries found in the central and eastern portion of the *ahupua'a*. No *kuleana* were granted within the Hanalei refuse transfer station APE or its immediate vicinity.

In 1862, the *ahupua'a* of Kalihikai was purchased by Robert Crichton Wyllie, a Scotsman who had made his fortune as a merchant in South America, and arrived in the Hawaiian Islands in 1844. Wyllie ultimately acquired portions of Hanalei and the *ahupua'a* of Kalihiwai (Wilcox 1996) and established a sugar plantation he dubbed "Princeville," in honor of the Hawaiian Prince Albert Edward Kauikeaouli Leiopapa a Kamehameha, who had been born in 1858, the son of King Kamehameha IV and Queen Emma. Wyllie intended to leave his estate to the prince, but Albert died at the age of four in 1862. Wyllie died just three years later in 1865 leaving his estate and plantation

deeply in debt. In 1867, Princeville Plantation was auctioned off to Elisha Hunt Allen, an official of the Hawaiian government. The Princeville Plantation operated until 1893. By 1899 Albert S. Wilcox had secured control of all the land of the Plantation and leased the coastal wetlands to Chinese rice growers and converted the agricultural uplands to cattle pasture (ibid.). On August 7, 1906, Wilcox filed an application with the Commissioner of Public Lands for the Territory of Hawai‘i to receive the royal patent to Keali‘iahonui’s lands in Kalihikai. The commutation payment was made and the survey completed and the Commissioner certified Keali‘iahonui’s claim as Land Patent No. 8183. In 1916 Wilcox sold some of the lands of the Princeville Plantation to the Līhu‘e Plantation whose interests were “the very valuable water rights which accompany them and to which seven miles of open ditches and tunneling under the mountains have given free access” (Damon 1931:918). Both rice cultivation and cattle ranching continued into the middle twentieth century.

Beginning in the 1960s, the Princeville area began its development as a major resort and condominium complex and the federal government acquired land (900 acres) from the Princeville Development Corporation for the U.S. Fish and Wildlife Waterbird Refuge established to the west of the current APE. The cattle ranch operated by Wilcox was maintained by Līhu‘e Plantation until 1969 when Princeville was sold to Consolidated Oil and Gas Corporation of Colorado. The remainder of the Princeville Plantation in the uplands was converted into a resort-residential community with hotels, condominiums, restaurants, and golf courses. A series of aerial images from 1950 (Figure 28,) 1978 (Figure 29) and 2021 (Figure 30) documents the condition and development of the Hanalei refuse transfer station APE over time.



Figure 28. 1950 Aerial imagery with Hanalei refuse transfer station APE outlined in Red.

2. Background



Figure 29. 1978 Aerial imagery with Hanalei refuse transfer station APE outlined in red.



Figure 30. 2013 aerial imagery with Hanalei refuse transfer station APE outlined in red.

Hanapēpē Refuse Transfer Station: Hanapēpē Ahupua‘a

Hanapēpē Ahupua‘a was part of the traditional district of Kona (modern district of Waimea), the largest of Kaua‘i’s five traditional political districts. Located on the southwestern side of Kaua‘i, Hanapēpē is bounded by the *ahupua‘a* of Ho‘ānuanu and Makaweli to the north and Wahiawa to the south. The name Hanapēpē literally translates as “crushed bay,” and according to Pukui et al. (1974) refers to the frequent landslides that occur in the area. Alternatively, Wichman (1998) suggests that Hanapēpē may more correctly be pronounced Hana-pēpēhi, which would translate to Killing Bay a name that may be derived for several legendary account. Hanapēpē Ahupua‘a is rife with *wahi pana* (legendary places) and related oral history. One such account relates that the *maka‘āinana* (common people) of the area purportedly disposed of an unreasonable, obsessive high chief by throwing him off Holoīwi (“traveling bones”) Cliff (Wichman 1998). Hanapēpē Ahupua‘a hosts several *leina a ka ‘uhane* - leaping places associated with the transit of the dead into Pō, the “place of the dead”, or afterlife ((Fornander 1996)). Hanapēpē is also traditionally known for its salt production, and salt pans from this area are said to have produced the finest and most desired salt on Kaua‘i, which people from all over would come in the summer months to gather (Wichman 1998:35).

During Precontact times, the Hanapēpē area, particularly Hanapēpē Valley supported extensive taro fields, both irrigated and dry; and along the coast there were numerous fishpond that were used for both agriculture and aquaculture. As mentioned, salt was harvested from ancient salt pans pockmarking the coast, and there were significant surf breaks that were traditionally recognized off Hanapēpē’s shores (Finney and Houston 1966). The Hanapēpē refuse transfer station is situated inland about 0.16 miles from the coastal salt pans.

The greater Hanapēpē area was described during the early Historic Period, and later the natural abundance of the area was exploited by Western visitor. Archibald Menzies, doctor and botanist under Captain Vancouver came to Waimea in 1792 and described a grass fire burning over the plains several miles to the east (which would be in the area of Hanapēpē). Captain Vancouver first supposed it to be a signal of hostilities but was told it was the annual burning to rid the plains of the old shriveled grass and stumps so the new grass crop would come up clear and free and such practice would provide the best grass for thatching houses (Menzies 1920:83). It is possible that the growing of pili grass was a former land use of the present project area in prehistoric times and early historic times (Winieski, 1996). Ethel Damon (1931:228) described the bounty at Waimea for the early British fur traders “[a]t Waimea these hardy voyagers wooded and watered, and found plenty of pork and salt to cure it.” Salt taken aboard ship at Waimea may well have come from the ‘*ili* of Ukula in Hanapēpē.

An episode of foreign intrigue that played out in the early Historic Period involved the Hanapēpē area. Between 1815 and 1817. Belluomini et al. (2016:17-20) describe the event:

Sandalwood also appears in the early historic literature of Hanapepe in the diary of Georg Scheffer of the Russian American Company, described in *Russia’s Hawaiian Adventure 1815-1817* (Pierce 1965). Scheffer was a Russian trader who scouted out sandalwood and other trading goods for his company. He tried to convince Russia to annex Hawai‘i and wanted to help Kaumuali‘i recapture all the other islands, for which Scheffer would be entitled to all the sandalwood. For several years he was on good terms with the ruling chief Kaumuali‘i and his high chiefs. Among the lands he was given by Hawaiian *ali‘i* were the *ahupua‘a* of Hanalei (renamed Schafferthal or Scheffer’s valley), land in Waimea for plantations and factories, the ‘*ili* of Mahinuali in Makaweli, followed shortly thereafter by a gift of the ‘*ili* of Kuiloa in Hanapepe.

...

The American traders felt threatened by Scheffer and plotted to put an end to his empire. Edward Joesting’s (Joesting 1984) version of the rivalry in 1822 among Scheffer, the Americans, and King Kamehameha, notes the Americans spread word that America and Russia were at war. Scheffer rushed from where he was staying in Hanapepe to Waimea to protect his ship. The Hawaiians and Americans made him leave Hawai‘i immediately without allowing him to take any of his possessions.

Hanapēpē also featured in Hawaiian domestic politics of the time as the Hanapēpē-Wahiawa area was the setting of a battle over control of island. As part of the wider conflict known as the ‘Kaua‘i Rebellion,’ this battle was the last effort to resist takeover by the Hawai‘i island ruling elite. When in 1824, Kaumuali‘i, ruler of Kaua‘i, died, he was succeeded by a nephew (Kahalai‘a) from Hawai‘i Island rather than by one of his sons (Keali‘iahonui or Humehume). A series of skirmishes and battles occurred throughout the Hanapēpē Ahupua‘a and neighboring landscapes between

factions of Kaua'i Ali'i and the forces of the O'ahu-based Liholiho (Kamehameha II). In August 1824, a battle occurred on the 'Ele'ele Plains of Hanapēpē, east of the current APE. Armed with traditional weapons, the army of the Kaua'i ali'i were overwhelmed by the cannons and rifles of the forces of King Kamehameha II. Slaughter of the local community ensued. First-hand accounts state most victims were women and children whose bodies were left where they fell (Joesting 1984). As Kamakau (1961:268-269) describes:

On August 8 the battle of Wahiawa was fought close to Hanapepe. The Hawaii men were at Hanapepe, the Kauai forces at Wahiawa, where a fort had been hastily erected and a single cannon (named Humehume) mounted as a feeble attempt to hold back the enemy. In the evening there was advance made, but the forces of Hawaii retired to Hanapepe for the night. A hard rain prevented the Kauai men from firing the grass that night and making a rush in the morning as they had intended. There had been a rainbow, and Hoapili predicted, 'if the base were on the other side and the tip here we should be defeated tomorrow, but since we have the base and they the tip we shall be the winners. I believe not one of our men will fall.' . . . Large numbers of Kauai soldiers had gathered on the battleground, but they were unarmed save with wooden spears, digging sticks, and javelins. Many women were there to see the fight. The men acted as if death were but a plaything. It would have been well if the gods had stepped in and stopped the battle. No one was killed on the field, but as they took to flight they were pursued and slain . . . For ten days the soldiers harried the land killing men, women, and children.

It is said that the many men, women, and children that were killed were left for the dogs or pigs to eat and were not allowed a burial (Winieski et al. 1996). Thus the battle of Wahiawa came to be known as the 'Pig eating' ('Aipua'a) (Kamakau 1961:233); and as Wichman (1998:28) points out, "This defeat of the Kaua'i chiefs marked the end of armed uprisings on Kaua'i against the unification efforts of the Big Island and Maui chiefs. Following the rebellion, queen regent Ka'ahumanu, as she did elsewhere, ordered the old gods, idols and sacred pōhaku of Kaua'i to be destroyed." Following this decisive battle:

. . . the chiefs all came together and Kalanimoku redistributed the lands of Kaua'i . . . The last will of Kaumuali'i, who had the real title to the lands, was not respected . . . It was decided that Kahalai'a should not remain as ruler, but the islands be turned over to the young king [Kauikaouli, Kamehameha III], and Kaikio'ewa was appointed governor . . . The lands were again divided. Soldiers who had been given lands but had returned to Oahu had their lands taken away, chiefs who had large lands were deprived of them, and the loafers and hangers-on (*palaualelo*) of Oahu and Maui obtained the rich lands of Kauai. (Kamakau 1961:269)

This redistribution set the stage for how the ownership of lands of Kaua'i was ultimately assigned. At the time of the 1848 *Māhele 'Āina*, King Kamehameha III laid claim to approximately 19,377 acres in Hanapēpē Ahupua'a excepting several 'ili (subdivisions of an *ahupua'a*), which were claimed by several other *ali'i*. For example, William Charles Lunalilo claimed the 'ili of Manuahi, Mataio Kekuanā'ō claimed the 'ili of 'Ele'ele, Ka'aha claimed the 'ili of Kauiloa, Kanehiwa claimed the 'ili of Kukuilolo. However other *ali'i* such as Paniani claimed the 'ili of Ko'ula but later relinquished his interest in half of the 'ili to King Kamehameha III who thereby placed it into the Government Land inventory. A similar relinquishment pattern is seen with the claim made by Kalunu (Kanunu) who relinquished half of the 'ili of Punalau to the King who then turned it over to the Government (Buke Māhele 1848). That portion of the *ahupua'a* retained by the King was placed into the inventory of Crown Lands.

Roughly 103 *kuleana* parcels were awarded to approximately 46 individuals within all of Hanapēpē. While several individuals were awarded a single parcel, many of the awardees received between two to a max of five parcels. These LCAw. parcels were distributed along the lower portion of the Hanapēpē River (below the 200ft. elevation) with a few parcels located on the eastern river bank and the majority along the western side of the river bank. Higher up along the western side of the river but below the Wainonoia Stream branch, were a few more *kuleana*. It was in this vicinity that the largest LCAw. was granted to the American Board of Commissioners for Foreign Mission (ABCFM). No *kuleana* were awarded within the Hanapēpē reduce transfer station APE, with the nearest cluster located roughly 0.23 miles to the east.

During the Hawaiian Kingdom Era (pre- Jan.17, 1893) portions of Hanapēpē were already engaged in commercial sugar cropping. In 1865 Scottish Immigrant, Elizabeth McHutcheson Sinclair purchase land and established two sugar plantations and a cattle ranch between Hanapēpē River and Waimea River. Sinclair acquired Makaweli Ahupua'a, but by description and in maps through the early 20th century, the purchase also appears to have included areas in Hanapēpē Ahupua'a (Joesting 1984). Sinclair partnered with her sons-in-law, Francis Gay and Aubrey Robinson, to

form the Gay and Robinson partnership, and then purchased more land in Hanapēpē, and by 1873 owned virtually the entirety of the Kona District (Joesting 1984). The change in land tenure coupled with a growing world market for Hawai‘i crops and political entanglement with the United States eventually set up a dramatic change in agriculture. Throughout the island of Kaua‘i, sugarcane cultivation became the dominant land use, economic force, and social driver. A photograph taken in Hanapēpē town in the mid-to-late 1880s (Figure 31) shows house plots west of the project area with structures and gardens flanking a muddy thoroughfare. Rice paddies are found throughout the lowland coastal zone.



Figure 31. Hanapēpē Town Middle to Late 1880s (from Hoerman 2019).

Historical maps and interviews with long-time residents indicate that the commercial center of Hanapēpē straddled the Hanapēpē River from the turn of the century, which to a certain degree it still does. The expansion of the town in the 1890s brought prosperity and several new businesses and buildings, increasingly operated by Asian immigrants. Chinese immigrants established a community on the west bank of the Hanapēpē River, while Japanese merchants ended up primarily on the east bank, on lands made available by the Territorial government. During the 1930s, Hanapēpē's prosperity began to decline. Merchants and farmers were impacted by the worldwide economic depression, and Nawiliwili Harbor in Līhu'e supplanted Port Allen as Kaua‘i's primary port and the belt highway traversing the west side of the island was re-routed to bypass the town in 1939. In the 1930s, Hanapēpē Valley was under heavy agricultural cultivation. In 1941, C. Brewer Co. leased land from Gay and Robinson and established the Olokele Sugar Company, which operated until 1994 before being reabsorbed into the Gay and Robinson family holdings. Gay and Robinson is the last of three sugar plantations in the Hawaiian Islands and the last family-owned plantation (Joesting 1984). Immigrants continued to arrive and purchase government lands during the WWII and post WWII period.

Beginning in 1949 the lands surrounding the APE for Hanapēpē Refuse transfer station, were purchased as Grants for commercial purposes and several cemeteries were also established (Figure 32) The area of the current refuse transfer station appears to have remained fallow land until the 1970s as can be seen in a series of aerial images from 1951 (Figure 33), 1960 (Figure 34), 1977 (Figure 35), and 2000 (Figure 36), which document continued cultivation of land to the west and development of infrastructure within the APE and to the east over time.

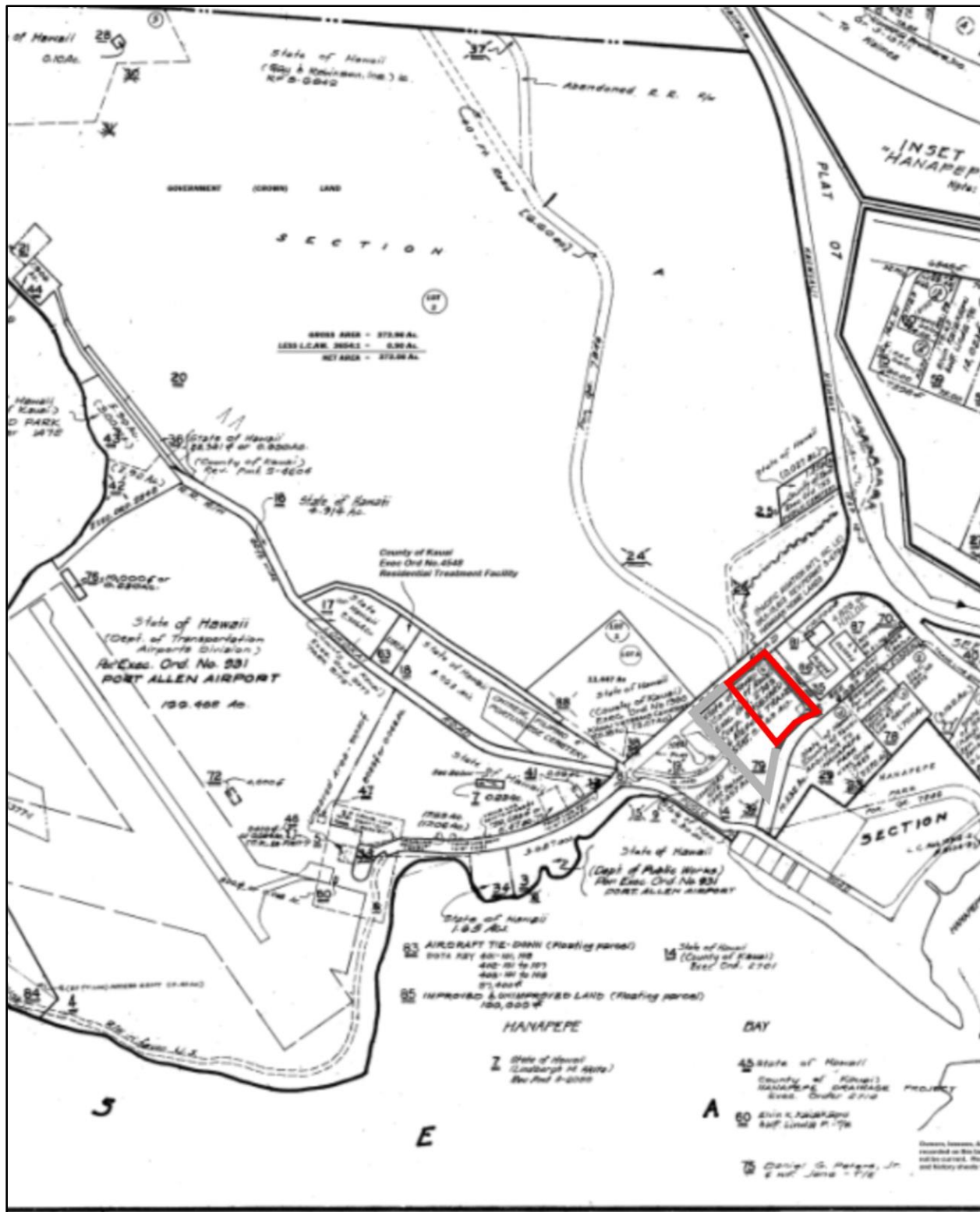


Figure 32. Tax map showing former and current land use in the vicinity of Hanapēpē refuse transfer station (outlined in red).



Figure 33. 1951 aerial image with the Hanapēpē refuse transfer station APE outlined in red.



Figure 34. 1960 aerial image with the Hanapēpē refuse transfer station APE outlined in red.



Figure 35. 1977 aerial image with the Hanapēpē refuse transfer station APE outlined in red.



Figure 36. 2000 aerial image with the Hanapēpē refuse transfer station APE outlined in red.

Kapa'a Refuse Transfer Station: Kapa'a Ahupua'a

The Kapa'a refuse transfer station APE is located in the *ahupua'a* of Kapa'a within the traditional *moku* or district of Puna (King 1935), but is now within the modern district of Kawaihau. A wholesale redistricting took place in the 1840s and the Puna District became the Līhu'e District, and then in 1878, King Kalakaua created the new district of Kawaihau encompassed the *ahupua'a* ranging from Olohena on the south to Kīlauea on the north. Subsequent alterations to district boundaries in the 1920s shifted the northern boundary to Moloa'a (King 1935:222); Kapa'a remained central to the Kawaihau District. Handy et al. (1991:423) describe Kapa'a as:

... a broad *ahupua'a* with wide and deep kula land. It has small ridges and valleys inland. There are two streams . . . Below the mountains there are extensive flatlands where there were terraces irrigated from Kapahi, Kakaleha, and Moallepi Streams; here the upper homesteads are located. Kapa'a River is formed by the confluence of these three streams. For four miles or more along the river, terraces were built on the pockets of level land along the shores, the flatlands of Waianuenue, another large stream; and much of coastal Kapa'a would certainly have been terraced for wet taro, where sugar cane is now planted.

Kapa'a is known for its *mo'olelo* concerning the lineage of Maweke of Kahiki (Tahiti) starting with his grandson, Mō'ikeha. *Ka Lulu o Mō'ikeha* is a legend that remembers the famous navigator, Mō'ikeha, born at Waipi'o, Hawai'i, but later in his life made Kapa'a his home. It is recounted that Mō'ikeha sailed to Kahiki, the home of his grandfather Maweke, after a disastrous flood led to famine in Hawai'i. Upon his return he settled on Kaua'i with his wife, chiefess Ho'oi'poikamalani, with whom he had three sons. Kila was favored by Mō'ikeha as he was considered the most handsome man on the island. Mō'ikeha instructed Kila to return to Kahiki to slay his old enemies and retrieve a foster son, the high chief La'amaikahiki (Beckwith 1970:352-358; Fornander 1916: vol.4 pt.1:160; Handy and Handy 1972:424; Kalākaua 1888:130-135). Writing in the Hawaiian Language Newspaper *Ku'oko'a*, Joseph Akina (1913) explains that when Kila traveled to Kahiki, he sought out his grandfather Maweke who asked if Mō'ikeha was enjoying himself to which Kila replied in chant:

My father enjoys the billowing clouds over Pohakupili,
The sticky and delicious poi,
With the fish brought from Puna,
The broad-backed shrimp of Kapalua,
The dark-backed shrimp of Pohakuhapai,
the potent awa root of Maiaki'i,
The breadfruit laid in the embers at Makialo,
The large heavy taros of Keahapana,
The crooked surf of Makalwa too,
The bending hither and thither of the reed and rush blossoms,
The swaying of the kalukalu grasses of Puna
The large, plump, private parts of my mothers,
Of Ho'oi'poikamalanai and Hinau-u,
The sun that rises and sets,
He enjoys himself on Kaua'i,
All of Kaua'i is Mō'ikeha's. (Akina 1913:6)

Maweke was delighted with the chant and learned that the boy came seeking fish for his family. Maweke then instructs Kila to lead the fish back to his homeland. Legend has it that this is how Kila stocked the islands with *akule*, *kawakawa* and *'opelu*. The 'Ōlelo No'eau, *Ka lulu o Mō'ikeha i ka laula o Kapa'a* (The calm of Mō'ikeha in the breadth of Kapa'a) recalls Mō'ikeha's love for his home (Pukui 1983:157).

Paka'a and the wind gourd of La'amaomao (Keahiahi) is another *mo'olelo* of the region. Paka'a was the son of Kuanu'uanu and La'amaomao. His father was a high-ranking retainer of Hawai'i's ruling chief Keawenuia'umi, who was the son and heir to chief 'Umi. La'amaomao, was said to be the most beautiful girl of Kapa'a, and member of a family of high-status *kahuna*. Kuanu'uanu met and married La'amaomao in Kapa'a but did not reveal his background or high rank to her until the day a messenger arrived, calling him back to the court of Keawenuia'umi. When Paka'a was old enough his mother prepared him to meet his father in Hawai'i by presenting him the gourd that contained the

2. Background

bones of her grandmother, also named La'amaomao, the goddess of the winds and conveyed to him the chants. With the gourd and chants taught to him by his mother, Paka'a could command the forces of all the winds in Hawai'i. The *Mo'olelo* of Paka'a tells of his exploits on Hawai'i and Moloka'i that recall the names of all the winds at all the districts on all the islands, preserving them for this and future generations (Beckwith 1970:86-87; Fornander 1918-1919:78-128; Nakuina 1990; Rice 1923:69-89; Thrum 1923:53-67). Frederick Wichman (Wichman 1998:84) recorded that Paka'a grew up on a headland named Keahiahi, where he learned to catch *malolo*, his favorite fish. There he studied the ocean and engineered a crab claw sail. He wove it and tied it out on his uncle's canoe and challenged the other fishermen to race to shore and convinced them to fill his canoe with fish. The fishermen began paddling toward shore but observed that Paka'a instead paddled farther out to sea. At first, he fumbled with the newly engineered mast and sail, causing the fisherman to laugh and lose the rhythm of their paddling. When his sail filled with wind, Paka'a turned toward shore and quickly overtook the fisherman and landed on the beach astonishing them with his skill. That night, Paka'a, his mother, and his uncle feasted on the huge catch of *malolo* (Wichman 1998:85).

Kapa'a was also renowned for its field of *kalukalu* grass as related in a line of a chant recited by Lonoikamakahiki, "Ki'imoena *kalukalu* Kapa'a" or "Kapa'a is like the *kalukalu* mats;" *kalukalu* was a sedge grass used for weaving mats (Fornander 1917:318-319 Pt. 2). Pukui (Pukui 1983:187) associated *kalukalu* with lovers in the *olelo noeau* "*Ke kalukalu moe ipo o Kapa'a*" or "*kalukalu* of Kapa'a that sleeps with the lover." According to (Wichman 1998:84):

... a *kalukalu* mat was laid on the ground under a tree, covered with a thick pile of grass, and a second mat was thrown over that for a comfortable bed, thus the association with lovers. Kaua'i was famous for this peculiar grass, and it probably grew around the marshlands of Kapa'a. It is thought to be extinct now, but an old-time resident of the area recalled that it had edible roots, 'somewhat like peanuts.' Perhaps it was a famine food source.

The legendary information suggests that Kapa'a had a sizeable population during the Precontact Period whose industry, like elsewhere on Kaua'i, was focused on taro cultivation and fishing. Glimpses in Kapa'a's Precontact settlement patterns and subsistence strategies can be gleaned from the testimonies collected during the *Māhele* of 1848.

During the *Māhele*, on January 28, 1848, William Pitt Leleiohoku laid claim to Kapa'a Ahupua'a, then relinquished his interest to King Kamehameha III who retained it as Crown Lands. Other *ali'i* also made claims for 'ili within Kapa'a, such as John Papa 'Ī'i who claimed Wakiu and Paikahawai, but later relinquished them to the King (Buke Māhele 1848). Twelve *kuleana* parcels were awarded to seven individuals within the *makai* portion of the *ahupua'a* (Figure 37). Five parcels were distributed along coastline and the remainder were located further *mauka*. Although no *kuleana* were granted within the Kapa'a refuse transfer station APE, two (LCAw. 8837:2 and 3 to Kamapaa) were located to the north of the project area and two (LCAw. 3638:1 to Huluili and LCAw. 8843:1 to Kiau) were located to the south. A review of Kamapaa's land claim (LCAw. 8837:2 and 3) documents indicates that these upland parcels contained nine *lo'i* and adjoining *kula* lands. His house lot (LCAw. 8837:1) was located near the shoreline in Ulukui Village. Huluili's land claim near the project area was for fifteen *lo'i* and adjoining *kula* lands. His house lot (LCAw. 3638:2) was along the coast in Kalolo village. Similarly, Kiau's had a house lot (LCAw. 8843:2) in Kalolo Village and six *lo'i* and adjoining *kula* lands near the current project area.

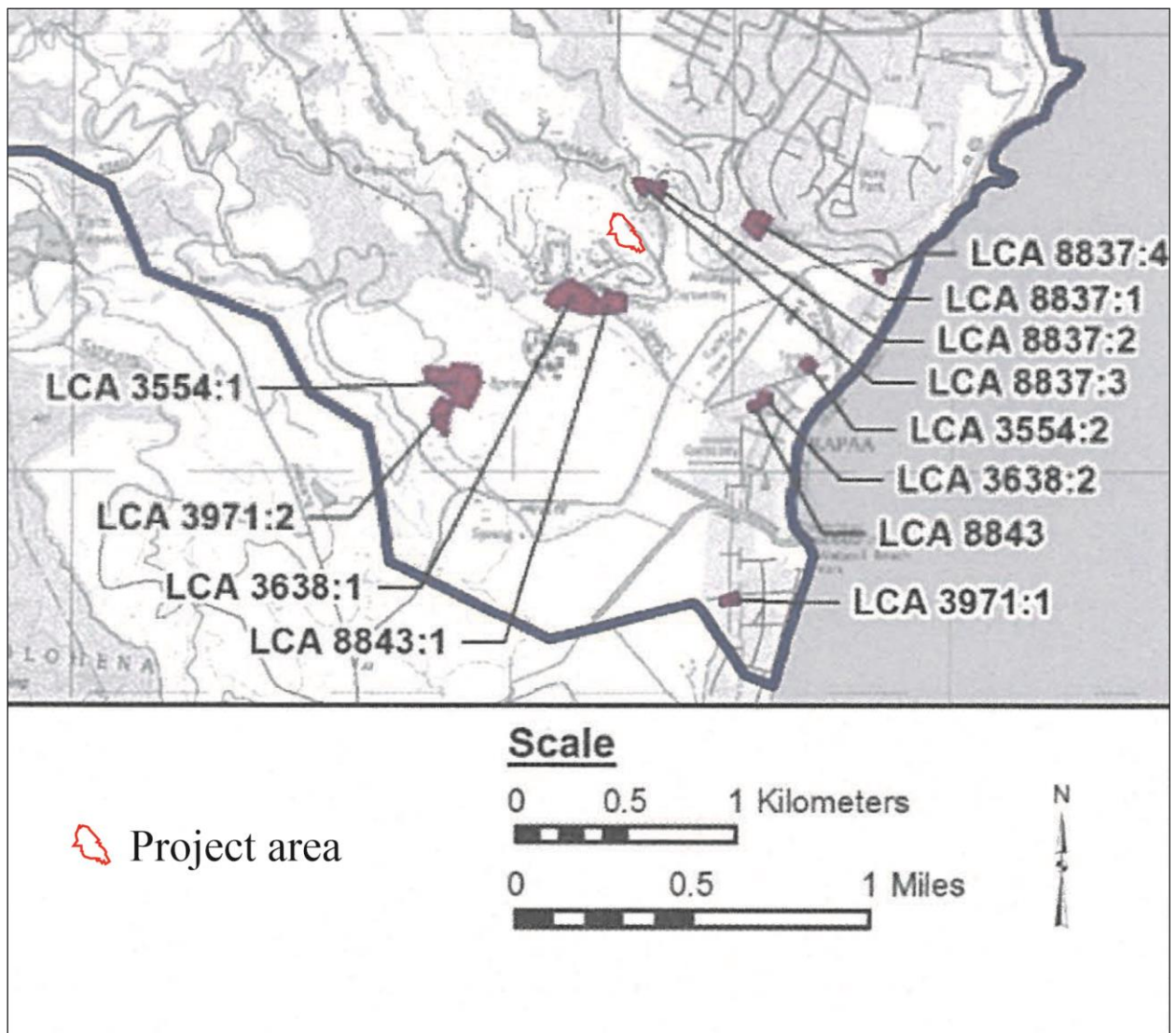


Figure 37. *Kuleana* in the vicinity of the Kapa'a refuse transfer station APE (adapted from McMahon 2015:26).

Like elsewhere on Kauaʻi, the commercial sugar industry in Kapaʻa started early in the Historic Period (ca. 1830s). Kapaʻa soil was particularly suitable for the sugarcane cultivation and in 1837, Kamehameha III (Kauikeaouli) granted a lease to Wilama Ferani, a merchant and U.S. citizen based in Honolulu, for the lands of Kapaʻa, Keālia and Waipouli. The twenty-year lease provided for:

... the cultivation of sugar cane and anything else that may grow on said land, with all of the right for some place to graze animals, and the forest land above to the top of the mountains and the people who are living on said lands, it is to them whether they stay or not, and if they stay, it shall be as follows: They may cultivate the land according to the instructions of Wilama Ferani and his heirs and those he may designate under him... (Hawaiʻi State Archives, Interior Dept., Letters, Aug. 1837).

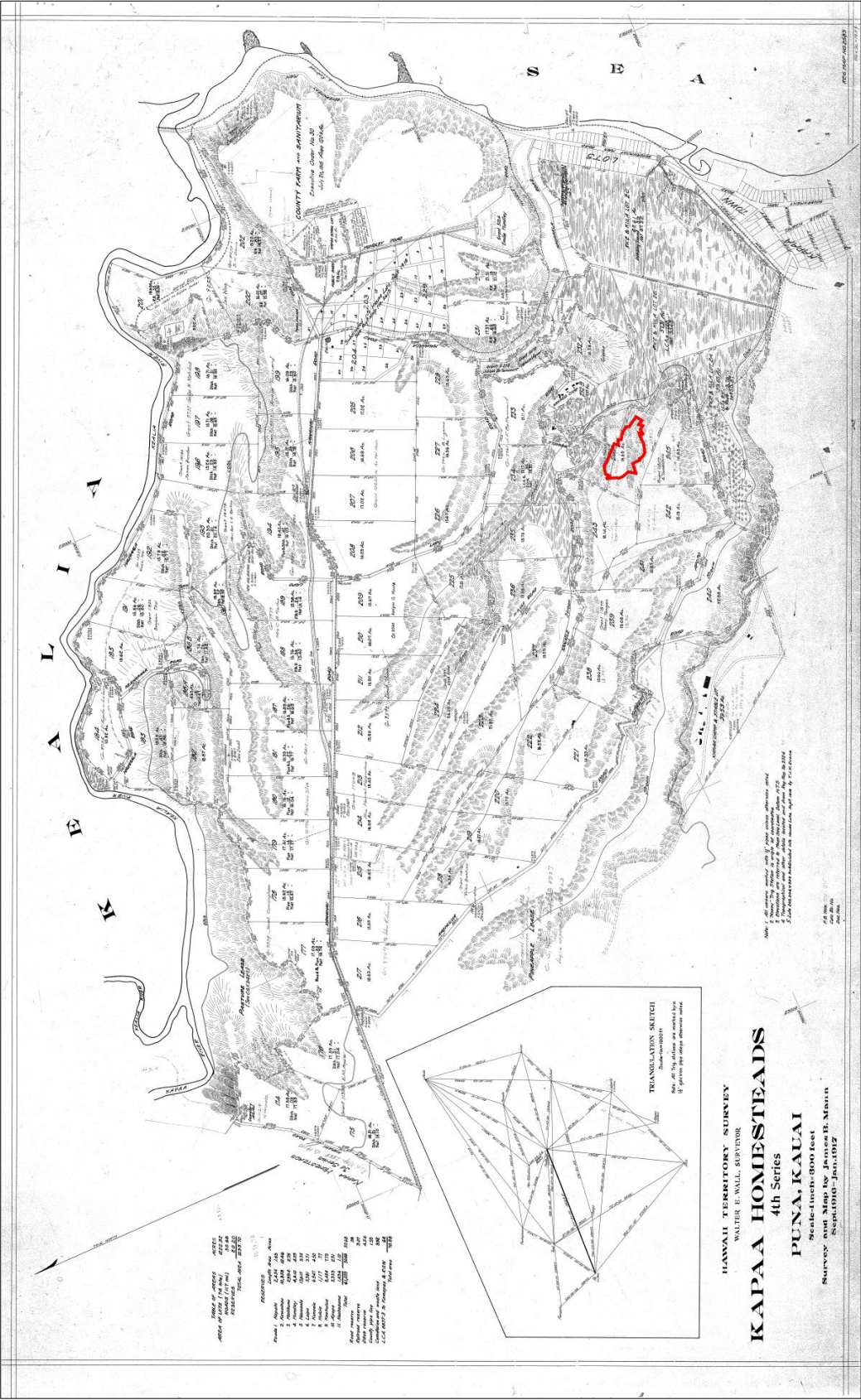
Joesting (1984:152) surmised that William French, a well-known Honolulu merchant who experimented with grinding sugarcane in Waimea on Kauaʻi at about the same time, is likely the Wilama Ferani being referenced.

Following the Reciprocity Treaty of 1875, which allowed Hawaiian sugar free access to the American market, cultivation in and around Kapaʻa greatly expanded. In 1877, the Makee Sugar Plantation and the *Hui Kawaihau* became the first large scale agricultural enterprise (Dole 1916). The *Hui Kawaihau* was originally a choral society begun in Honolulu whose membership boasted many prominent Hawaiian and *haole* names. The Makee Plantation was successful on Maui and King Kalakaua encouraged the *Hui* members to collaborate with Makee to establish a successful sugar corporation on the east side of Kauaʻi. Kalakaua granted Captain Makee the land within the newly established Kawaihau District, and specifically in Kapaʻa to build a mill to grind the cane grown by *Hui* members. The *Hui* attempted to grow sugarcane at Kapahi, on the plateau lands above Kapaʻa for four years. Following a fire that destroyed almost one half of the *Hui*'s second crop and the death of Captain James Makee, the *Hui* dispersed. The property and leasehold rights passed on to Makee's son-in-law and new Makee Plantation owner, Colonel Z.S. Spalding (Dole, 1916:14). The Makee Landing was built after Colonel Spalding took control of the Plantation and in 1885, he moved the mill to Keālia Ahupuaʻa (Cook 1999; (Damon 1931). Condé and Best (1973) suggested that railroad construction for the Makee Plantation started shortly after the relocation of the mill, for when Queen Liliʻuokalani visited Kauaʻi in the summer of 1891, the royal party was treated to music by "[t]he band [that] came by ship to Kapaʻa and then by train to Keālia" (Joesting 1984:252). This railroad line in 1910 ran south from Keālia Mill and split in the center of Kapaʻa Town, one route going to the old Kapaʻa Landing (Makee Landing) and another line headed *mauka* across the present Mōʻikeha Canal, southwest up Lehua Street and along a plateau and into the *mauka* area behind the Kapaʻa swamplands. This railroad line was part of a twenty-mile network of plantation railroad that ran through Kapaʻa (Condé and Best 1973:180).

By the late 1800s, Makee Plantation employed over one thousand workers, many of whom were immigrants from Portugal and Japan (Cook 1999). The new Western style of government and market economy prompted the expansion of a western education. In 1883, Makee Sugar Company and the Board of Education signed an agreement for a lease to build a public school. The original Kapaʻa School, constructed in 1883, was located on a rocky point (Kaahiahi) adjacent to the Makee Sugar Company railroad. In 1908 it was relocated to its present site up the hill at Mailehune (Kapaʻa Elementary School 1983).

By the early 1900s, the Kapaʻa population was expanding, and the government began auctioning land off as town lots in Kapaʻa to help with the burgeoning plantation population. While some of the land was purchased by immigrants to live and develop small businesses, much of it was scooped up by large companies leading to the further development of the area. In 1913, Hawaiian Canneries Company Limited opened on leased lands now occupied by Pono Kai Resort (Cook, 1999:56). In 1923 they purchased their leasehold (8.75 acres) (Bureau of Land Conveyances, Grant 8248), and by 1956, the Cannery packed 1.5 million cases of pineapple. By 1960, 3400 acres were in pineapple cultivation and they employed 250 full time employees and 1000 seasonal employees (Honolulu Advertiser, March 20, 1960). In 1962, they closed due to competition from growers with a cheaper labor market outside of the United States.

Within the vicinity of the project area, The Kapaʻa Homesteads 4th Series was surveyed and a map produced (Figure 38) between 1916 and 1917. These homestead lots were granted as were "rice and *kula*" lots. The current Kapaʻa refuse transfer station APE occupies the southern two-thirds Lot 244 and was established by the Territory of Hawaii in 1935 along with a roadway easement crossing Lot 245 (Figure 39). A series of aerial images shows the development of the immediate project area in 1950 (Figure 40), 1965 (Figure 41), 1978 (Figure 42), and 2013 (Figure 43).



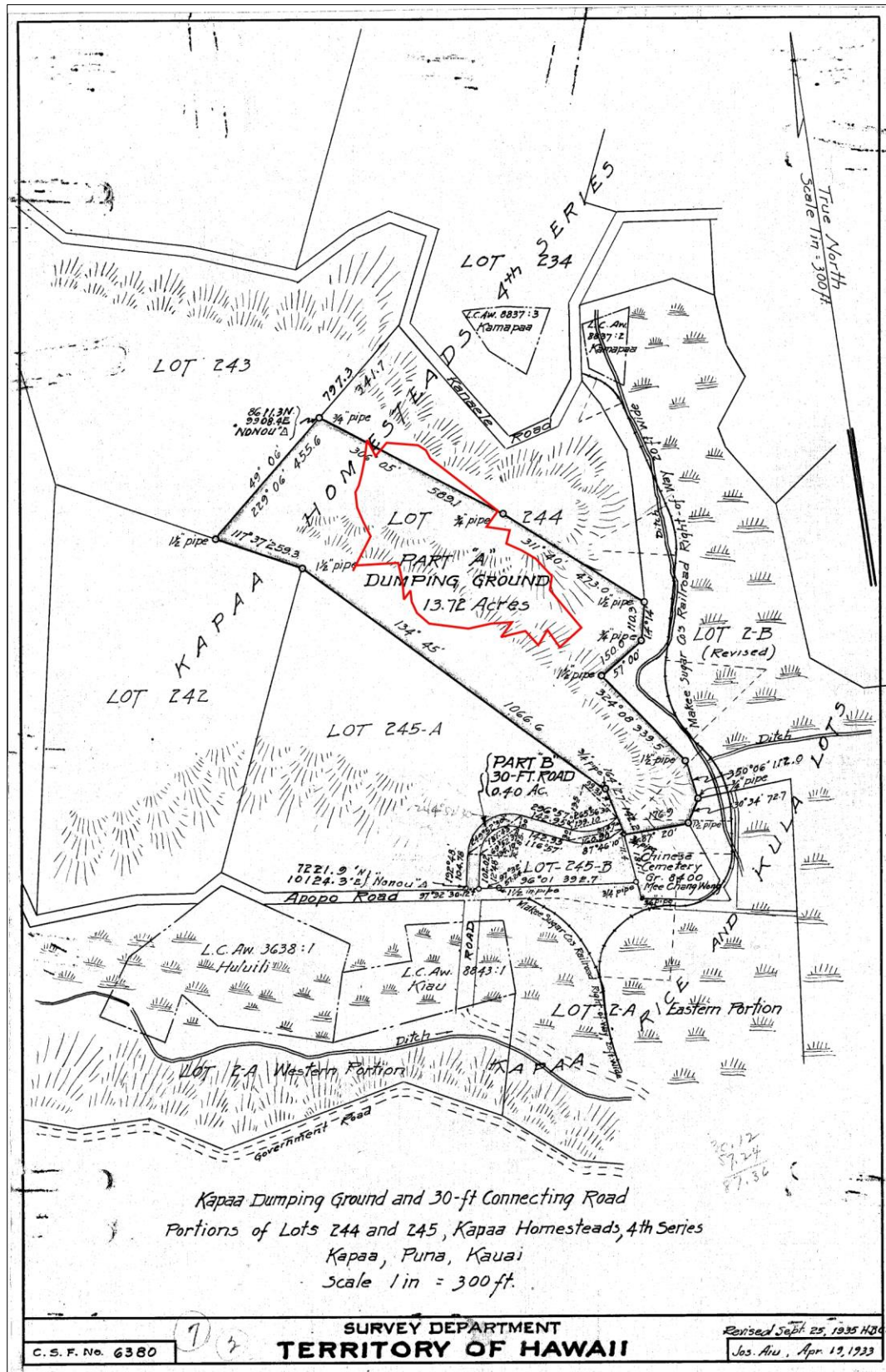


Figure 39. 1935 map for CSF 6380 creating the Kapa'a Homesteads 4th Series Dumping Ground with Kapa'a refuse transfer station APE outlined in red..



Figure 40. 1950 aerial image with the Kapa'a refuse transfer station APE outlined in red.



Figure 41. 1965 aerial image with the Kapa'a refuse transfer station APE outlined in red.



Figure 42. 1978 aerial image with the Kapa'a refuse transfer station APE outlined in red.



Figure 43. 1978 aerial image with the Kapa'a refuse transfer station APE outlined in red.

Līhu‘e Refuse Transfer Station: Hanamā‘ulu Ahupua‘a

The Līhu‘e refuse transfer station APE is located in the *ahupua‘a* of Hanamā‘ulu within the traditional *moku* or district of Puna (modern district of Līhu‘e). Hanamā‘ulu is bounded on the north by Wailua Ahupua‘a and on the south by Kalapakī Ahupua‘a. The Puna District extended from Kipu, south of Līhu‘e to Kama‘oma‘o‘o, just north of Kealia. District names and boundaries went through modification during the 1840s when the Puna District became the Līhu‘e District, named for its primary town.

According to Fornander, the earliest legends of ancient Kaua‘i describe an independent society and one separated from the islands of O‘ahu, Moloka‘i, Maui and Hawai‘i. Until the time when Kaua‘i was under the rule of Kukona, the seventh *mō‘ī*, or ruling chief, “Kauai, its government, and chiefs, had been living apart, or not mingled much with the chiefs or events on the other islands” (Fornander 1996:92). Fornander specifically mentions Hanamā‘ulu as the birthplace of Kaweloleimakua the namesake of the Legend of Kawelo, a famous ruler of Kaua‘i whose maternal grandparents foresaw his future at the time of his birth. They called the parents of Kawelo and said to them: “Where are you two? This child of yours is going to be a soldier; he is going to be a very powerful man and shall someday rule as king.” (Fornander 1918-1919:2).

Kawelo was taken from Hanamā‘ulu to Wailua and raised by his grandparents until they all relocated to O‘ahu where Kawelo took up farming and married Kanewahineikiaoha. Kawelo went on to master both fishing and the art of war and had become renowned for his feats of strength. He returned to Kaua‘i to defend his family against Aikanaka who had stolen Kawelo’s parents land and resources and led his small army to victory, dividing the island among his followers. Fornander mentions the Hanamā‘ulu again in the following sentence, “After the conquest of Kauai, Kawelo and his wife Kanewahineikiaoha took up their residence in Hanamā‘ulu (Fornander 1918-1919:62).” In a footnote, Fornander describes Hanamā‘ulu as “adjacent to Wailua, the principal township of old-time Kauai (ibid:62).” According to Fornander, after narrowly surviving a brush with death at the hands of Aikanaka and his followers, Kawelo lived out his life in Hanamā‘ulu with his wife and parents.

Several locations and topographic features within the vicinity of Hanamā‘ulu Ahupua‘a have legendary associations. For instance, in the legend “The Goddess Pele”, recorded by William Hyde Rice (1923), Ahukini and Hanamā‘ulu are both mentioned by name. In this legend, the handsome king of Kaua‘i, Lohiau became the object of affection of the goddess Pele and her sister Hi‘iaka. In a jealous rage, Pele ordered her sisters to kill him and cover him in lava on the slopes of Kilauea on the Island of Hawai‘i. Upon seeing his body turned to stone within a lava flow, two of Pele’s brothers reacted thusly:

Pity welled up in their hearts and they brought Lophiau to life again. One of these brothers made his own body into a canoe and carried the unfortunate Lohiau to Kauai, where he was put ashore at Ahukini.

Coming to Hanamā‘ulu, Lohiau found all the houses but one closed. In that one were two old men, one of whom recognized him and asked him to enter. The men were making tapa which they expected to carry soon to Kapaa, where fairs were being held in honor of Kaleiapaoo and his bride Hiiaka. (Rice 1923:16-17)

According to Rice, because of his visit to Kaua‘i, Lohiau was reunited with his love Hi‘iaka and they lived out their lives together in Hā‘ena.

In the legend above, the reference to Ahukini likely refers to Ahukini *heiau*, which once stood near Ahukini Point, to the southeast of the current APE in neighboring Kalapakī Ahupua‘a. Another reference to the Hanamā‘ulu comes from the following Hawaiian proverb *No Hanamā‘ulu ka ipu puehu*, which translates as “the quickly emptied container belongs to Hanamā‘ulu” (Pukui 1983:252) and may imply that food was often scarce in Hanamā‘ulu.

The wind that travels across the Hanamā‘ulu landscape is also noted in legendary accounts, being just one of 269 winds traditional identified on Kaua‘i (Kanahale, 2005) and as described in an ancient wind chant: *He Ho‘oluakanehe ka makani o Hanamā‘ulu* — Moving in two directions from the land or from the ocean, is the free blowing wind of Hanamā‘ulu.

Prior to European contact, the Hawaiian economy was subsistence based with an emphasis on *kalo* (taro) production. *Kalo* is most productive when it is planted in cool, fresh, shallow water (Wilcox 1996). To create these conditions, early Hawaiians developed terraces or *lo‘i* that contained dikes or *pani wai*, which were used to divert water from nearby streams. This water was then channeled through a network of irrigation ditches or *‘auwai*. Within Hanamā‘ulu conditions for such agricultural systems existed along the river that traverses through Hanamā‘ulu Valley

and empties into Hanamā'ulu Bay to the north of the current APE. It was within this river valley and along the bay where Precontact settlement within the *ahupua'a* was centered. As described by Handy et al. (1991:425-426):

South of Wailua there is a very large stream named Hanamaulu flowing from the side of Kilohana crater through a broad gulch in which there were many terraced flats, beginning about two and a half miles upstream. The large delta area where the stream flows into the bay undoubtedly was covered with *lo'i* for wet-taro cultivation before this land was taken over for sugar cane. Much of the higher land now planted with cane must formerly have been used for growing sweet potatoes.

The *kula* lands of Hanamā'ulu Ahupua'a, as with elsewhere on Kaua'i would have been used for the dry-land cultivation of *'uala* (sweet potato), *pia* (arrowroot), dryland taro, as well as *wauke* (paper mulberry). The upland and forest zones were areas of resource collection, where birds, *hala*, *kukui* nuts, and firewood were obtained. An indication of a significant albeit modest Precontact population in Hanamā'ulu is the presence of only one ethnohistorical recorded *heiau* (Kalaokamanu Heiau) and the fact the Hanamā'ulu was the birth and death place of Kawelo, the late seventh century paramount chief.

Traditional landscapes within the Hanamā'ulu area were observed and described by early missionaries and their families while traveling between mission stations. In 1824 Reverend Hiram Bingham traveled from the mission station in Waimea to Hanalei passed through inland portions of Hanamā'ulu, as Damon recounted:

In 1824, when walking around the island from Waimea to consul the people after the wreck of *The Cleopatra's Barge*, Rev. Hiram Bingham crossed from Hamapepe, as been seen, over the old upland trail back of Kilohana [through Hanamā'ulu], and wrote of it as "a country of good land, mostly open, unoccupied and covered with grass, sprinkled with trees, and watered with lively streams that descend from the forest-covered mountains and wind their way along ravines to the sea, - a much finer country than the western part of the island" (Damon, 1931:401)

Twenty-five years later, in 1849, William DeWitt Alexander, son of Wai'oli missionary William P. Alexander traveling between the Kōloa mission station and the Wai'oli mission station recorded the following with respect to Hanamā'ulu Valley:

... A few miles further on we crossed the picturesque valley of Hanamaulu. This valley is prettily bordered by groves of Kukui, koa, & hala trees, and is well cultivated with taro. A fine stream flows through the midst of it, which makes a remarkable bend at this place like a horse shoe. We then traveled along the seashore at the foot of a range of hills through groves of hau, & among hills of sand. It was now after dark, but the moon shone brightly, and there was no difficulty in finding our way. At about eight o'clock we arrived at the banks of the Wailua river. (Alexander 1933)

As a result of the *Māhele* of 1848, Hanamā'ulu Ahupua'a was awarded as *konohiki* land to Victoria Kamāmalu (LCAw. 7713:2), despite a competing claim made by Paul Kanoa, which was rejected. Victoria Kamāmalu was the sister of Alexander Liholiho (King Kamehameha IV), Lot Kapuāiwa (King Kamehameha V), and half-sister of Ruth Ke'elikōlani; who upon Victoria's death in 1866 inherited the Hanamā'ulu land.

There were an additional fifteen *kuleana* awarded to *maka'āinana*, principally within the Hanamā'ulu River Valley from the seashore inland for roughly a mile. Land use recorded in *Māhele* testimony indicates that residences were located along the coast and taro *lo'i* and *kula* lands were in the flood plain areas of the river valley. Both coastal and *mauka/makai* trails are mentioned in the *kuleana* testimony, the latter being identified at *'ili* and *ahupua'a* boundaries. There were no *kuleana* awarded in the vicinity of the current study area.

The boundary certification for Hanamā'ulu, possibly prepared in 1891, was in the Land File of the State Archives with the papers of O'ahu Governor John Dominis, and reads as follows:

Document 336 of State Survey Office, Describing Boundaries of Hanamaulu

Commencing upon the sea, at the mouth of the small stream called Kawailoa, and upon the southerly bank of the said stream running from thence South 74° West 90 chains to the top of the hill called Kailiiahinale bounded by the land called Wailua, belonging to His Majesty the King, from thence North 82° West 494 chains, passing over the plains to the top of the mountain range called Waialeale, thence South 76° East 204 chains following along the top of the said mountain range called Waialeale to a certain peak, standing upon the northwesterly corner of land called Haiku from thence North 86° [?] East 166 chains to the top of the hill called Momakuhana bounded by the land Haiku, thence South 84° East 114 chains crossing the mountain road leading to Kilauhana, and passing down the range of hills on the makai side of Kilauhana, and through a small ravine to a certain koa tree, a short distance south of the Hanamaulu River, thence South 82° East 126 chains

crossing the plantation of H.A. Peirce & Co. to a certain kukui tree, standing alone on the plains makai of the above plantation of H.A. Peirce & Co, marked K, bounded by the land called Kalapaki, thence North 75° 45' East 102 chains passing over the plains to the point of rock, upon the sea called Opoi, which forms the northeasterly corner of land called Kalapaki, from thence following the sea to the point of commencement. Comprising an area of 9,177 Acres (Waihona 2018).

This boundary certification makes mention of the 'plantation of H.A. Peirce & Co.,' which references the sugarcane plantation started by Henry A. Pierce in 1849, which later became the Līhu'e Sugar Plantation. In 1870, the *konohiki* lands of Hanamā'ulu was sold to Paul Isenberg and incorporated into the Līhu'e Sugar Plantation.

A condensed history of the formation and early operation of the Līhu'e Sugar Plantation was published in the *Pacific Commercial Advertiser's* 50th Anniversary Edition dated July 2, 1906, and read:

Lihue sugar plantation is interesting because of its phenomenal success and the many obstacles which have been encountered and overcome all through its progress, and especially during the early years when the sugar industry in Hawai'i was in its experimental stages.

The early records of the plantation show that in 1854 Messrs. Henry Peirce, Wm. L. Lee, Wm. C. Parke, Edwin O. Hall, C.R. Bishop, C.W. Austin, W. H. Bates formed a copartnership under the name of Henry A. Peirce & Co. whose business should be to plant sugar cane, manufacturing sugar, and all other branches of business theretofore carried on by the proprietors of the said plantation, which indicates that the plantation which indicates that the plantation had been in operation prior to that date. Mr Rice was the manager. The mill which stood on the present site, was run by water power, the crop amounted to 120 tons of sugar. The plantation store stood near the site of the present manager's residence on the road to Koloa, and was conducted by Mr. Samuel T. Alexander. In front of the store was a large open space surrounded by a grove of koa and kukui trees where natives from all parts of the island congregated on Saturday afternoons, bringing products of all kinds for sale. Wailua produced hau rope; Kapaa was noted for its rush hats and mats, while bullock cart loads of melons were brought from Anahola and Kealia. The taro and sugar cane from Waihiawa was regarded by the natives as especially fine in quality and was in demand for the use of the chiefs not only in Kauai, but in Honolulu as well. The salt produced in the ponds of Makaweli took the color of the soil blown from the land and was regarded as a luxury because of its red tinge. Opihi's from the mountains were then, as today, regarded by Hawaiian epicures as particularly toothsome, and all these staple supplies, food and delicacies found their way to Lihue market.

It was Mr. Rice who first introduced irrigation on the fields in Hawai'i. the average yield of sugar per acre was, at that time, only one-half tons and was insufficient to make the industry a profitable one, and he conceived the idea of bringing the waters of the Kilohana stream on to the plantation for irrigation, and he built a ditch for that purpose. Even with irrigation the outlook for the place was evidently dark, for in 1861 a proposition was considered to abandon the planting of sugar cane. Mr. Paul Isenberg was an employee of the plantation at the time and it was due to his advice and efforts that the proposition to abandon was given up, and planting was continued.

In the year 1862 Mr. Rice died and Mr. Isenberg succeeded to the management of the estate. Mr. Isenberg was a man of strong character, clear foresight and indomitable will and energy, who, by his perseverance and example, not only pulled Lihue plantation through difficulties of extraordinary success, but he inspired his neighbors with pluck to plod along to a successful issue against conditions, at times, most discouraging. So great was his faith in the sugar industry in Hawaii that, when later he had acquired an interest in the plantation, and his proposal to purchase the *Hanamaulu* lands was opposed by his partners, he entered into an agreement with them whereby any loss which might be incurred in the planting of these lands was to be borne by him individually, whereas any profit arising from the same was to go in as a general realization to the several partners. The tract in question contains 17,000 acres and was bought for \$8,500, which price was regarded by some members of the firm as too high.

Men of Mr. Isenberg's discernment rarely err in such matters. It was this purchase which gave to Lihue plantation its present water supply, and added thousands of acres of fine cane land . . .

In 1877 Mr. A. S. Wilcox was given a contract to plant the tract on shares; the mill was erected by Lihue plantation . . . and in 1899 Mr. A. S. Wilcox, giving up Hanamaulu, the cultivation of that place was taken up by Lihue plantation, since which time the two places have been run in conjunction, although the cane of the respective places has been ground at its own mill. . . . Mr.

Wolters (manager) succeeded in increasing the crop of the combined places, Lihue and Hanamaulu, to 18,000 tons (*Pacific Commercial Advertiser* 1906:60-1).

Prior to the twentieth century, the current project area was not part of the cultivated sugarcane land as can be seen on Figure 44. The twentieth century history of the plantation continued to exhibit many innovations with respect to growing sugarcane, as well as producing and manufacturing sugar. In the Hanamā‘ulu portion of the plantation, Hanamā‘ulu Bay was developed as a commercial vessel port when the plantation built the Ahukini Landing. In a 2008 posting in the GardenIsland.com, Soboleski summarized the history of the Ahukini Landing area:

The first pier on Hanama‘ulu Bay was a concrete block built at Kou on the north side of the bay in 1890. Rowboats would carry freight and passengers between this pier and inter-island steamers anchored offshore. Not long afterward, a small concrete pier and a short breakwater were also built at Ahukini on the south side of the bay. Ahukini then became the first port on Kaua‘i where inter-island vessels could tie up directly to shore. The original eight houses of Ahukini Camp were also constructed by Lihue Plantation at that time. When a new pier and breakwater were built at Ahukini in 1920, transpacific Matson freighters of that era could likewise tie up directly. That same year, Ahukini Terminal & Railway Co. was organized to operate a freight railroad linking Ahukini with sugar plantations in the Lihue, Kawaihau and Kilauea districts and the Kapa‘a pineapple cannery. Railroad trackage included the line from Ahukini to Lihue mill and north to Kealia via Kapa‘a. Between 1922 and 1925, 34 more houses were built at Ahukini on the makai side of the county road and along the coast toward the Nawiliwili Lighthouse. In 1930, when construction of Nawiliwili Harbor was completed, the bulk of Kaua‘i’s cargo began moving through Nawiliwili and inter-island service to Ahukini stopped. The dismantling of the Makee mill at Kealia in 1934 further reduced shipping at Ahukini. Matson freighters continued to call regularly at Ahukini until Matson modernized its fleet after World War II with bigger ships. Thereafter, only tank barges called at Ahukini to supply its tank farm. Port operations at Ahukini closed in 1950, yet excess sugar from the sugar storage plant built at Niumalu that same year was stored temporarily at two warehouses at Ahukini until 1965, the same year Ahukini Camp was razed (Soboleski 2008).

In 1922, American Factors, Ltd. (AMFAC) acquired control of the Lihue Plantation Company through a stock purchase and by 1930 the sugar yield increased to 36,506 tons. The WWII years slowed the plantations efforts, but by September of 1944 the plantation was back in full swing with roughly 5,000 employees. And by 1947, a record 59,417 tons of sugar were produced. The current APE is shown to have been under cultivation on a 1941 map of the plantation (Figure 45). A series of aerial photographs taken in 1950 (Figure 46), 1959 (Figure 47), 1978 (Figure 48) show the continued cultivation of the APE, and by 2000 (Figure 49) the current facility is present. While it was not until November 2000 that AMFAC closed the Lihue Plantation Company, cultivation in the Hanamā‘ulu field section in the vicinity of the APE, seems to have stopped in the middle 1980s. Following the abandonment of sugarcane cultivation in Hanamā‘ulu, the County of Kaua‘i prepared an Environmental Assessment (GMP Associates 1990) for the development of the Lihue refuse transfer station, and a few years later it was constructed.

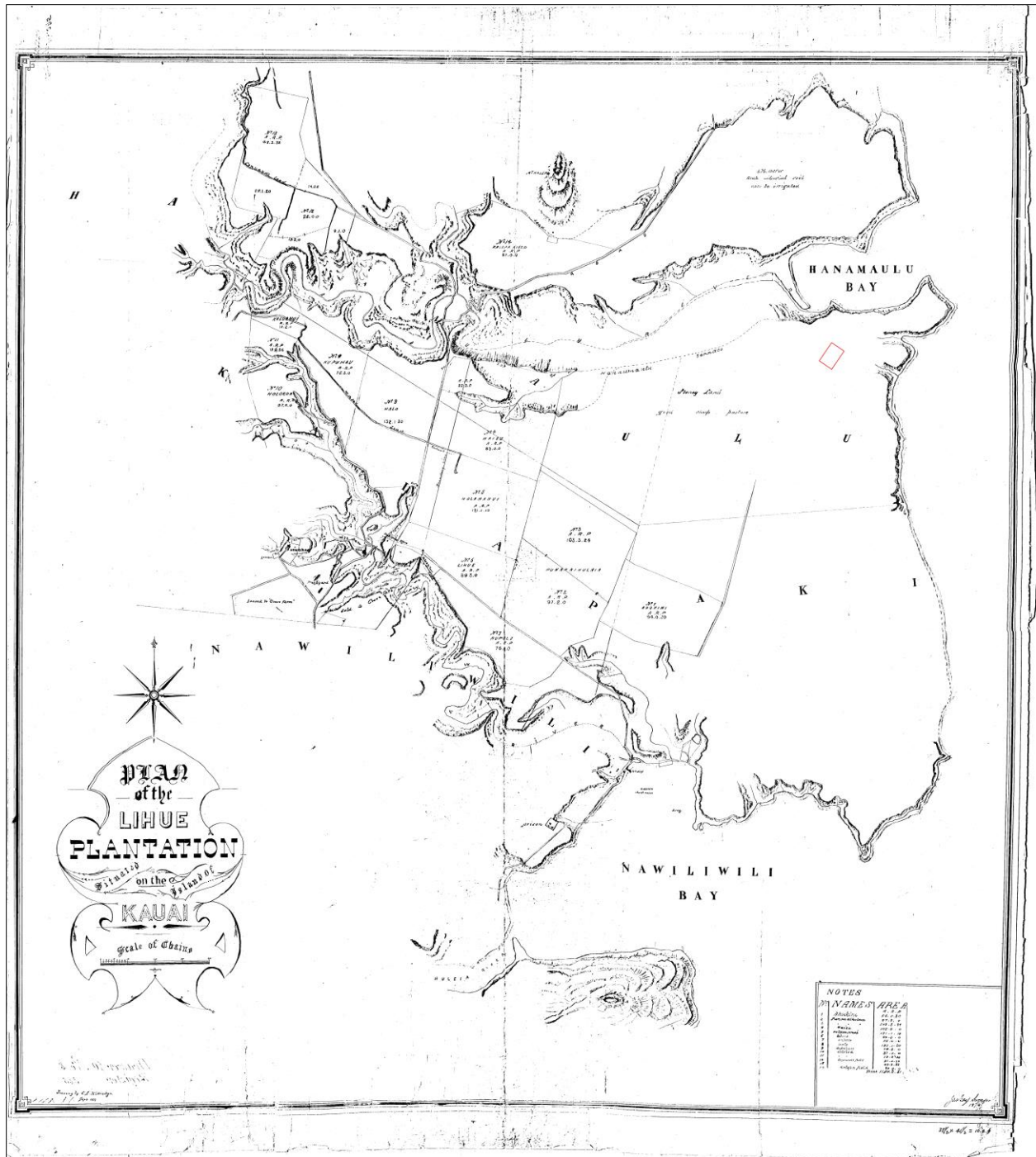


Figure 44. 1876 map of the Līhu‘e Plantation with Līhu‘e refuse transfer station APE outlined in red.

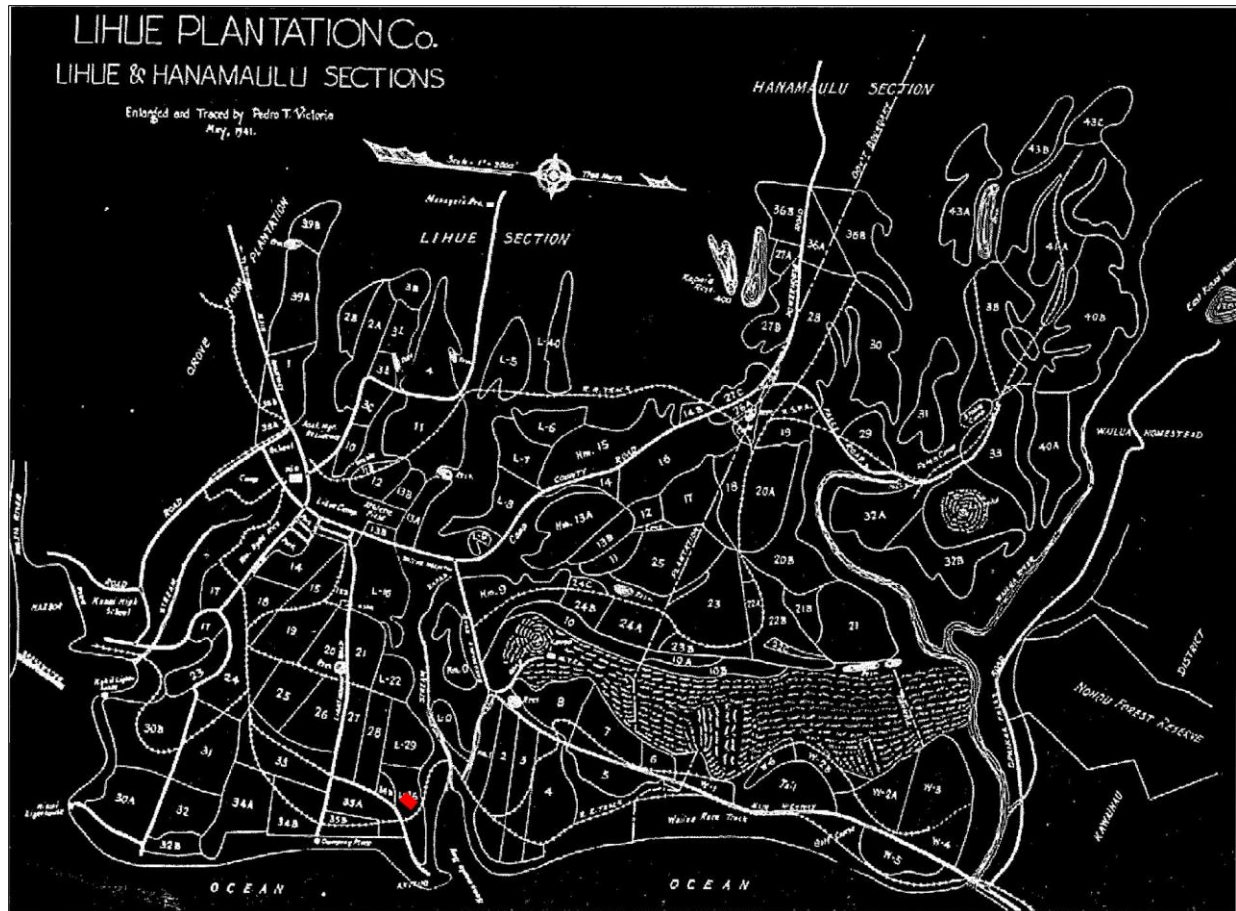


Figure 45. 1941 map of the Lihue Plantation with Lihue refuse transfer station APE in red.



Figure 46. 1950 aerial image showing Līhu'e refuse transfer station APE outlined in red.



Figure 47. 1959 aerial image showing the Līhu'e refuse transfer station APE outlined in red.



Figure 48. 1978 aerial showing Līhu'e refuse transfer station APE outlined in red.



Figure 49. 2000 aerial image showing Līhu'e refuse transfer station APE outlined in red.

PRIOR ARCHAEOLOGICAL STUDIES

The earliest archaeological study in Kauaʻi is that of Thomas G. Thrum, who created a list of the *heiau* of ancient Hawaiʻi. Thrum published his list of *heiau* in a series of entries in the *Hawaiian Almanac and Annual*, beginning with the 1907 edition published in 1906. Of his investigations, Thrum noted the following:

This much is being realized, and expressions of regret have been freely made, that we are at least fifty years too late in entering upon these investigations for a complete knowledge of the matter, for there are no natives now living that have more than hear-say information on the subject, not a little of which proves conflicting if not contradictory . . . While these difficulties may delay the result of our study of the subject, there is nevertheless much material of deep interest attending the search and listing of the temples of these islands that warrants a record thereof for reference and preservation. (Thrum 1906:49-50)

A more formal archaeological survey of Kauaʻi was conducted by Wendell C. Bennett on behalf of the Bishop Museum between June of 1928 and June of 1929. Bennett's purpose was "to locate and describe the remains of all Hawaiian structures, to describe the artefacts of Kauai and to review the literature relating to Kauai" (Bennett 1931: 53). In a paper entitled *Kauai Archeology* presented to the Hawaiian Historical Society in 1930, which predated the publication of his monograph, Bennett (1930) noted that the population of Kauaʻi was distributed primarily along the coasts, river valleys, and inland as far as irrigable land would reach, while the mountains were only sparsely inhabited. Bennett refers to Thrum's 1906 list of *heiau* on Kauaʻi as "a very complete list" and goes on to emphasize that Thrum included sacred places and small *heiau* in his list (ibid.:57). Bennett noted a lack of the "great massive forms [of *heiau*] so characteristic of the later Hawaiian epoch" and an abundance of smaller (less than fifty feet in size) *heiau* on Kauaʻi (Bennett 1931:59). He also mentioned the difficulty in distinguishing these small ceremonial structures from house sites, due to their similarities in form, which consisted mainly of simple platforms or enclosures. Bennett recorded twenty "principal large *heiau*" on his survey of the island, three of which were listed as "destroyed" (Bennett 1931:58-59). None of these *heiau* included those previously recorded by Thrum, discussed above. Bennett also included a discussion of distinctively Kauaʻi artifacts, namely block grinders and ring-form food rubbing stones/pounders. Other interesting and potentially relevant observations made from his literature review include the presence of polished stone knives, carved stone bowls, the utilization of dressed stone in ditch construction, and that on Kauaʻi women as well as men made *poi*.

Archaeology remained a purely academic discipline until the establishment of environmental protection laws in the 1970s, which created a whole new industry for archaeological investigation and the birth of Cultural Resource Management (CRM). Under the auspices of CRM, archaeological study became commonplace with respect to proposed development activities. Numerous such studies have been conducted in the areas of all four of the refuse transfer stations under consideration. A review of prior archaeological studies conducted in the vicinities of each of the refuse transfer stations is presented below.

Hanalei Refuse Transfer Station

There have been few archaeological studies conducted in the vicinity of the Hanalei refuse transfer station APE. The earliest of these, the compilation of *heiau* on Kauaʻi by Thrum (1907), noted the presence of Poʻokū Heiau approximately 1,200 meters west of the current APE. This *heiau* was also included in Bennett's (1931) survey of Kauaʻi archaeological sites as Site 139 (now SIHP 50-30-03-139).

Since the late 1970s, the few archaeological studies conducted near the project area (Table 1; Figure 50) have been CRM related. In 1979, the Bishop Museum conducted an archaeological reconnaissance survey (Cleghorn 1979) of 620 acres *makai* of the current APE. Only one site, an upright boulder and a semicircular area excavated into a ridge slope (SIHP 50-30-03-1702), was identified. The site was interpreted to be a military observation or defensive position constructed during WWII. The majority of their survey area had been disturbed by extensive bulldozing and clearing activities associated with commercial agriculture.

In 1980, Archaeological Research Center Hawaii, Inc., conducted an archaeological reconnaissance (Hammatt 1980) of three parcels adjacent to Kauai Belt Road between Kalihiwai and Princeville (see Figure 50). All three parcels exhibited extensive modern modification. No historic properties were identified.

In 1990, the Bishop Museum conducted an archaeological and historical reconnaissance survey (Quebral and Cleghorn 1990) of the proposed Kūhiō Highway Realignment Project. The project area was located along the Kauai Belt Road (Hwy 56) between Kalihiwai and Princeville and included a small portion of the current APE (see Figure

2. Background

50). Four drainage tunnels extending beneath the highway were recorded, but not assigned SIHP numbers or considered to be historic properties. No sites were identified within the current APE.

In 2009, Cultural Surveys Hawai'i conducted an archaeological inventory survey (Yucha and Hammatt 2009) for a proposed subdivision in Princeville, *makai* of the current APE (see Figure 50). The survey identified 11 historic properties including three Precontact irrigation ditches (SIHP Site 50-30-03-5013, 5018, and 5019), a Precontact habitation/agricultural complex (Site 5014), two Precontact terraces (Site 5015 and 5022), a Precontact modified outcrop (Site 5016), a Historic wall (Site 5017), a Historic Bunker (Site 5020), a Historic cemetery (Site 5021), and a Precontact habitation/burial/agricultural complex (Site 5023).

Table 1. Relevant prior archaeological studies near the Hanalei refuse transfer station APE.

<i>Author and year</i>	<i>Type of study</i>	<i>Relevant findings</i>
Cleghorn 1979	Reconnaissance	Upright boulder (WWII military feature, Site 1702)
Hammatt et al. 1980	Reconnaissance	No historic properties identified
Quebral & Cleghorn 1990	Reconnaissance	Drainage tunnels, not assigned SIHP numbers
Yucha and Hammatt 2009	Inventory	Precontact ditches (Sites 5013, 5018, 5019), terraces (Sites 5015, 5022), modified outcrop (Site 5016), habitation/agricultural complexes (Sites 5014, 5023); Historic wall (5017), military bunker (5020), and cemetery (5021).

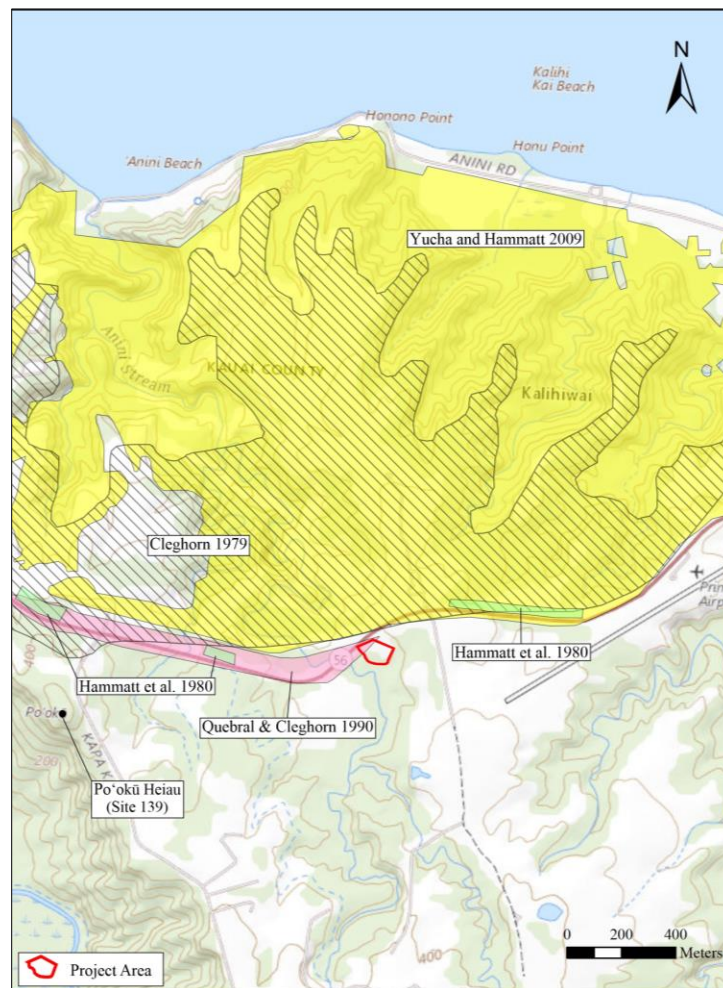


Figure 50. Prior archaeological studies within the vicinity of the Hanalei refuse transfer station APE.

Hanapēpē Refuse Transfer Station

In addition to the island-wide studies by Thrum (1907) and Bennet Bennett (1931:112), prior studies in the vicinity of the Hanapēpē refuse transfer station have largely consisted of CRM inventories and monitoring studies (Table 2, Figure 51). Thrum (1907) documented seven *heiau* complexes in Hanapēpē Ahupua‘a, four of which are in the general vicinity of the current APE. The nearest of these was Kauakahinunu Heiau (SIHP Site 50-30-09-51), located at the coast on Puolo Point (southwest of the current APE). Other *heiau* in the general vicinity of the APE included three that were destroyed during the nineteenth century: Mākole (Site 54) and Pualu (Site 55) located northeast of the APE, and Kuwiliwili (Site 48) located west of the APE. Bennet Bennett (1931:112) documented several sites along the coast, including salt pans (Site 49), the Hanapēpē Complex (Site 50), and a house site (Site 52) on Pu‘olu Point. Bennett also noted that sand burials (Site 53) could be found on the northwest side of Hanapēpē Bay.

Table 2. Relevant prior archaeological studies near the Hanapēpē refuse transfer station APE.

<i>Source</i>	<i>Type of Study</i>	<i>Findings</i>
Kikuchi 1963	Inventory	Historic burials, Heiau salt pans, house sites, rock shelters, shrines, canoe shed walls, enclosures, rock formations, middens, petroglyphs
Kikuchi and Remolado 1992	Inventory of cemeteries	
McMahon 1993	Archaeological Survey	Inadvertent Burial Discovery
Creed et al. 1994	Archaeological Inventory Survey	Two human burials, State Inventory of Historic Places (SIHP) Site #s 50-30-09-704 and 705, and a cultural deposit, State Site 50-30-09-706
McMahon 1994	Archaeological Survey	Inadvertent Burial Discovery SHIP Site 50-30-09-651 Concerned about further remains in area
Creed et al. 1995	archaeological subsurface inventory survey	discontinuous cultural deposit (State Site # 50-30-09-706) radiocarbon dated to the historic period and two human burials (State Site #s 50-30-09-704 and 50-30-09705) were discovered No analysis was conducted, the remains were preserved in place.
Kennedy and Latinis 1996	Archaeological Treatment	Inadvertent Burial Discovery Site 50-30-09-53
Pietruszewsky 1996	Examined remains of inadvertent burial	Determined the remains of Site 50-30-09-53 to be of Hawaiian or Polynesian Ancestry
Winieski et al. 1996	Archaeological Monitoring Report	One primary coffin burial, SIHP Site # 50-30-09-1987, additional scattered/fragmented human burials
Hammatt 2001	Inventory	Potential for subsurface deposits identified as high near current APE
Monahan and Powell 2005	Monitoring	Hanapēpē Bridge 1911 Historic Property & Road base
Wasson and Dega 2015	Archaeological Inventory Survey Subsurface testing	No significant findings
Belluomini et al. 2016	Final Archaeological Inventory Survey Report	SIHP Site #s 50-30-09-2280, the Hanapēpē River Bridge; 50-3009-2281, a historic wall; 50-3009-2282, a basalt retaining wall; 50-30-09-2283 a large earthen and piled basalt stone berm; Sites-2280 and -2283 NRHP eligible
Hazlett and Dega 2017	Final Archaeological Assessment	No cultural deposits or archaeology identified; monitoring requested by the SHPD

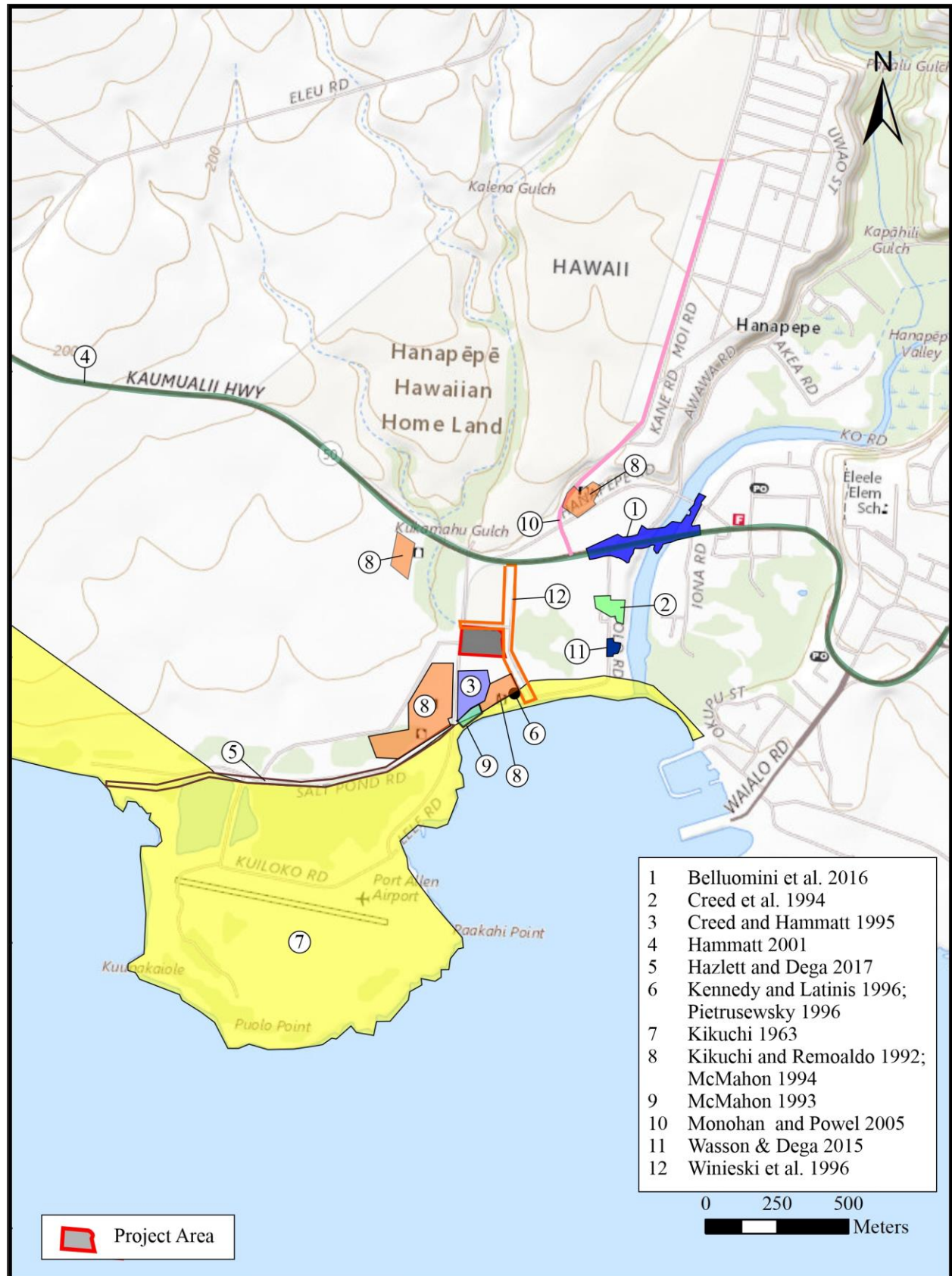


Figure 51. Prior archaeological studies within the vicinity of the Hanapēpē refuse transfer station APE.

In 1963, Kikuchi (1963) conducted an archaeological survey of the Kona District (see Figure 51). In addition to visiting sites identified by Bennett (1931), he identified a subsurface cultural layer (SIHP 50-30-09-3038) at the shoreline *makai* of the APE.

In 1992, Kikuchi and Remoaldo (1992) conducted an inventory of cemeteries on the Island of Kauaʻi. Cemeteries located near the current APE that were documented in the inventory include the Veteran's Cemetery (SIHP 50-30-09-604), the Hanapepe Cemetery (Site 651), and the Filipino Cemetery (Site 608) (see Figure 51).

In 1993, McMahon (1993) documented an inadvertent burial discovery southwest of the current project area near Hanapēpē Bay. She reported a leg bone and mandible exposed in sand below the surface of old Puolo Road (SIHP 50-30-09-53) in between Kukamanu Gulch mouth and Hanapēpē Japanese Cemetery (Site 651).

In 1994, McMahon (1994) conducted an Archaeological Survey or inspection of Hanapēpē Japanese Cemetery (TMK (4) 1-8-008:014; see Figure 51) due to an inadvertent burial discovery designated SHIP Site 50-30-09-651. She discovered a humerus at the exposed corner of the cemetery in a pile of driftwood. The humerus exhibited white discoloration indicating that it had been exposed for some time. She expressed concern that more remains might be found in the area.

In 1994, Cultural Surveys Hawaiʻi conducted an archaeological inventory survey (Creed et al. 1994) of two parcels located east of the APE on the west bank of the Hanapēpē River (see Figure 51). During backhoe trenching, a discontinuous cultural deposit (SIHP 50-30-09-706) dating from the Historic Period and two human burials (SIHP Sites 50-30-09-704 and 705) were discovered. The human burials were preserved in place.

In 1995, Cultural Surveys Hawaiʻi conducted an archaeological inventory survey (Creed and Hammatt 1995) with subsurface testing of a 3.246-acre parcel located southwest of the APE (see Figure 51). No historic properties were identified.

In 1995, Archaeological Consultants of the Pacific (Kennedy and Latinis 1996) responded to the inadvertent discovery of human remains during construction of Pūʻolo Road at the coast south of the APE (see Figure 51). They postulated that the burial may have been a feature of SIHP 50-30-09-53, originally identified by Bennett (1931) as a possible ancient sand burial. Analysis by Pietruszewsky (1996) determined that it was of Hawaiian or Polynesian ancestry.

In 1996, Cultural Surveys Hawaiʻi conducted archaeological monitoring (Winieski et al. 1996) during the Hanapēpē Drainage Improvement Project, part of which was adjacent to the north and east boundaries of the current APE (see Figure 51). One Historic burial (SIHP 50-30-09-1987) was encountered near the Japanese Cemetery southeast of the current APE, and other isolated human skeletal fragments were found in sand deposits within the bank of the Hanapēpē Canal.

In 2001, Cultural Surveys Hawaiʻi conducted an archaeological inventory survey (Hammatt 2001) for a proposed fiber optic cable project along Kaumualiʻi Highway, a portion of which is located north of the current APE (see Figure 51). The survey was designed to define the potential for subsurface historic properties along the route. The section of project corridor nearest to the current APE was determined to have a high potential, although nothing of significance was encountered.

In 2005, Scientific Consultant Services (Monahan 2005) reported negative findings during archaeological monitoring for the Kauaʻi Rural Fiber Optic Duct Lines project, which followed the Hammatt (2001) project corridor near the current APE (see Figure 51).

In 2015, Scientific Consultant Services conducted an archaeological inventory survey (Wasson and Dega 2015) of four parcels in Hanapēpē Town southeast of the current APE (see Figure 51). No surface or subsurface historic properties were identified.

In 2016, Cultural Surveys Hawaiʻi conducted an archaeological inventory survey (Belluomini et al. 2016) for the Hanapepe River Bridge Replacement Project located east of the current APE (see Figure 51). The AIS identified four historic properties, including the Hanapepe River Bridge (SIHP Site 50-30-09-2280), two retaining walls (Sites 2281 and 2282), and a flood control levee (Site 2283).

In 2017, Scientific Consultant Services conducted an archaeological inventory survey (Hazlett and Dega 2017) in support of a County of Kauaʻi Department of Public Works utility installation project at Salt Pond Beach Park, to the south-southwest of the current APE (see Figure 51). No cultural deposits or previously undocumented archaeological sites were noted.

Kapa‘a Refuse Transfer Station

There have only been a few archaeological studies conducted in the immediate vicinity of the Kapa‘a refuse transfer station APE (Figure 52); however, development near the coast has resulted in a number of inventory and monitoring studies *makai* of the APE. In Thrum’s (1907) compilation of *heiau* on Kaua‘i, no *heiau* are listed for Kapa‘a. Bushnell et al. (2002) compiled a list of sixteen *heiau* in Kapa‘a and Keālia from a collection of Lahainaluna student compositions (Hawai‘i Ethnographic Notes I:214, 216). The exact locations of these *heiau* were not known. Bennett (1931) identified two sites, (SIHP Sites 50-30-08-110 and 111) within Kapa‘a Ahupua‘a. Both of these sites were located well *mauka* the current APE.

Beginning in the 1990s, CRM studies (Table 3, see Figure 52) in support of various projects located near the coast and on former sugarcane lands. These included surveys for improvements to Kūhiō Highway (Hammatt et al. 1997; Perzinski and Hammatt 2001), sewer line improvement projects (Creed et al. 1995; Hammatt 1991), and business and residential development (Chaffee et al. 1994a, 1994b; Hammatt et al. 1994; McMahon 1994; Spear 1992). Project areas located inland of Kūhiō Highway (Chaffee et al. 1994a, 1994b; Hammatt et al. 1997; Hammatt et al. 1994; McMahon 1996a, 1996b; O’Leary et al. 2006) generally did not contain any historic properties. In 1992, archaeological monitoring (Spear 1992) for the Cost-U-Less project adjacent to the McMahon (1996a) project area identified a buried fire pit and rock foundation (SIHP Site 50-30-08-547) associated with Historic artifacts. Multiple project areas located on Juacas sand deposits near the coast, however, contained human remains (Bushnell and Hammatt 2000; Callis 2000; Creed et al. 1995; Erkelens et al. 1994; Jourdane 1995; Kawachi 1994). In their survey of historic cemeteries on Kaua‘i, Kikuchi and Remoaldo (1992) documented two located *makai* of the current APE. Cemetery B004 is north of Apopo Road roughly a kilometer *mauka* of Kūhiō Highway; and Cemetery B013 is located on the *mauka* side of Kūhiō Highway and *makai* of Ulu Street.

Table 3. Relevant prior archaeological studies near the Kapa‘a refuse transfer station APE.

<i>Author and year</i>	<i>Type of Study</i>	<i>Findings</i>
Hammatt 1981	Reconnaissance	None
Hammatt 1991	Inventory	Two subsurface cultural layers.
Kikuchi and Remoaldo 1992	Cemetery inventory	Two cemeteries
Spear 1992	Monitoring	Fire pit and foundation, Historic
Hammatt et al. 1994	Inventory	None
Kawachi 1994	Burial report	One burial
Chaffee et al. 1994a	Inventory	None
Chaffee et al. 1994b	Inventory	None
Creed et al. 1995	Monitoring	Twenty-six burials
Jourdane 1995	Burial report	One burial
McMahon 1996a	Inventory	None
McMahon 1996b	Inventory	None
Hammatt et al. 1997	Inventory	None
Bushnell and Hammatt 2000	Monitoring	One isolated fishhook blank
Callis 2000	Burial report	One burial
McIntosh and Cleghorn 2000	Inventory	Eleven Historic sugarcane cultivation features
Perzinski and Hammatt 2001	Monitoring	None
O’Leary et al. 2006	Inventory	None
McMahon and Tolleson 2013	Inventory	None
Gotay et al. 2020	Inventory	One Historic bridge

Archaeological Study at Four County of Kaua‘i Transfer Station

Three relatively large surveys (Hammatt 1981; McIntosh and Cleghorn 2000; McMahon and Tolleson 2013) (see Figure 52) of former sugarcane fields resulted in the identification of no Precontact-era archaeological resources. The McIntosh and Cleghorn (2000) survey of a 398.45-acre parcel located to the west of the current APE, however, recorded eleven sugar industry-related, Historic features (SIHP Site 50-30-08-989). These features included an irrigation ditch tunnel, a rock wall, a 3.3-acre reservoir, a railroad and concrete bridge remnants, two concrete bridges with curbing, a concrete and wooden irrigation ditch control gate, and a concrete water diversion. No further work was the recommended treatment for these resources.

Most recently, in 2019 ASM Affiliates conducted an archaeological inventory survey (Gotay et al. 2020) for a proposed roadway improvements project over portions of Olohena Road located south of the current project area (see Figure 52). A single historic site, Olohena Bridge 2 (SIHP 50-30-08-2396), was identified.

Līhu‘e Refuse Transfer Station

The area surrounding the Līhu‘e refuse transfer station APE has been subject to numerous archaeological studies (Table 4, Figure 53), primarily inventory surveys. In Thrum’s (1907) compilation of *heiau* on Kaua‘i, there are three *heiau* near the current APE. The nearest of these, Ahukini Heiau, was located on the bluff overlooking the sea at Ahukini Point. Thrum (1907) noted that only its foundations remained. Kaluaokamanu Heiau was located approximately 1.3 miles to the northwest of the APE. Thrum (1907) reported that the *heiau* had been destroyed in about 1855. The third, Pohakoelele, was also reported by Thrum (1907) to be destroyed. Bennett (1931) revisited Ahukini Heiau (which he designated Site 101) and Kaluaokamanu Heiau (Site 102) and noted that both had been destroyed.

During the decades that followed Bennett’s initial survey of Kaua‘i, no archaeological studies of the Līhu‘e District were produced. However, beginning in the 1990s, lands within Hanamā‘ulu Ahupua‘a became the subject of some archaeological investigations related to the ongoing development of the area, particularly related to expansion of Līhu‘e Airport, the coastal area along Hanamā‘ulu Bay, and in neighboring Kalapakī Ahupua‘a.

In 1988, Cultural Surveys Hawai‘i, Inc. (CSH) conducted an archaeological reconnaissance (Hammatt, 1988) of roughly 150 acres of coastal land between Līhu‘e Airport and Ninini Point for the proposed Kaua‘i Lagoons Resort, located to the southwest of the current APE (see Figure 53). As a result, five archaeological sites were recorded, including three Historic wall remnants, a midden scatter, and an oval terrace. Hammatt also reported that the area was heavily disturbed. In 1991, CSH conducted additional archaeological survey (Hammatt 1990) of a portion of the Kaua‘i Lagoon Resort lands (TMK: (4) 3-5-001:102). No cultural resources were encountered as a result of this subsequent study.

In 1989, PHRI conducted an archaeological inventory survey (AIS) of the roughly 66-acre proposed Hanamā‘ulu Affordable Housing project area (Walker, 1990), located to the northwest of the current APE between Hanamā‘ulu Stream and Kūhi‘o Highway (see Figure 53). As a result of their variable coverage surface survey and limited subsurface testing, the only cultural material encountered were isolated coral fragments on the surface.

In 1990, SHPD conducted an archaeological field inspection of three land parcels (McMahon 1990) located to the west of the current APE (see Figure 53). As a result, three previously recorded historic residences were identified (SIHP Sites 9390, 9401, and 9402).

In 1990, PHRI conducted a roughly 1,500-acre AIS as part of the preparation for an Environmental Impact Statement for the Līhu‘e/Puhi/Hanamā‘ulu Master Plan Project. The resultant report (Walker, 1991) was never submitted to SHPD for review. The western half of the current study area falls within the northeastern edge of one of their project area’s discontinuous study units. However, the current APE was the subject of field inspection rather than inventory-level survey. As a result of their study, ten previously unrecorded archaeological sites SIHP Sites 1838-1847), comprising fourteen features, were identified. The majority of which were recorded well outside of the current study area, to the north and west of Hanamā‘ulu Bay. Functional feature types included the following: habitation, transportation, and burial. Seven of the ten identified sites were assessed as significant for information content; four of which were recommended for further data collection. Of these, three of the sites are of historic age and likely associated with Lihue Plantation and the remaining site is a Historic Japanese and Filipino cemetery. A subsequent AIS conducted by PHRI in 1994 (Franklin et al. 1994) of even discontinuous parcels resulted in a summary of the findings of the Walker and Rosendahl (1990) and Walker et al. (1991) studies because the project area coincided with those earlier studies.

In 1999, CSH conducted an AIS of several discontinuous parcels (see Figure 53) associated with development at Līhu‘e Airport (Folk et al. 1999). As a result of their study, no prehistoric or historic cultural remains were identified

within their study area. However, Creed et al. did document fifteen concrete slab foundations as part of previously recorded Ahukini Landing (SIHP Site 50-30-08-9000). The foundations were interpreted as the remains of residential structures and infrastructure related to Ahukini Camp.

About ten years after the Walker et al. (1991) fieldwork was completed, PHRI consulted with Dr. Ross Cordy to review the results of the earlier survey and returned to a portion of the project area in 2001 (Corbin et al. 2002) to relocate and update their assessments of the previously identified sites recorded as part of the Walker et al. (1991) study. The Corbin et al. (2002) study area, known as the Ocean Bay Plantation at Hanamā'ulu, consisted of roughly 460 acres, located to the north of the current APE along Hanamā'ulu Bay. The seven sites recorded within the Corbin et al. (2002) study area during the original survey (SIHP Sites 50-30-08-1838 thru 1841, 1843, 1845, and 1846) were relocated and three additional sites (SIHP Sites 50-30-08-2066 thru 2068) were identified. The ten recorded sites were comprised of four complexes and six single-feature sites, containing fourteen features. Functional feature types included the following: habitation (cultural deposit, wall, and terrace), transportation (retaining wall, bridges, roads, concrete foundation), burial (a historic cemetery and one possible isolated burial), and a dump. A radiocarbon sample from Site 1838, a coastal habitation complex, yielded a date range A.D. 1170-1400 for the occupation of Feature A. Most of the artifacts recovered were non-indigenous in origin and of recent age. Midden analysis revealed a prevalence of shallow water marine taxa at Site 1838. All ten sites were identified in areas that were either unaltered or only minimally impacted by Historic sugarcane cultivation. The Historic Period sites were likely associated with the sugarcane cultivation and transport or nearby Ahukini Landing.

In 2006, CSH conducted an AIS of roughly 175 acres of discontinuous lands (see Figure 53) associated with additional improvements to Līhu'e Airport (Bell et al. 2006). As a result of their study, a historic complex of concrete enclosures and foundation remnants (SIHP Site 50-30-08-3958) was identified along the seacoast to the east of the current study area. Site 3958 was interpreted as a plantation-era pig farm and no further work was the recommended treatment. Ahukini Road. Most of the proposed alignments follow extant paved or unimproved roads. As a result of their field inspection seven previously recorded properties, located along the coast were identified. Of these seven only two are located somewhat close to the current study area, the historic pig farm (SIHP Site 3958) and Ahukini Landing (SIHP Site 50-30-08-9000). In 2015, International Archaeological Research Institute, Inc. (IARII) conducted a supplemental AIS for the Ho'oluna at Koheā Loa Housing Development Project, which had been previously studied by Walker and Rosendahl (1990) and Franklin and Walker (1994), located to the northeast of the current study area. As a result of their fieldwork, a nine-feature site was recorded.

In 2008, CSH conducted a field inspection for roughly 8 miles of bicycle and pedestrian trail routes between Nāwilwili, Ahukini Landing, and Līhu'e Civic Center (see Figure 53), and reported their findings along with an archaeological literature review (Monahan and Hammatt 2008). A portion of the proposed alignment passes the current study area along Ahukini Road. The majority of the proposed alignments follow extant paved or unimproved roads. As a result of their field inspection seven previously recorded properties, located along the coast were identified. Of these seven only two are located somewhat close to the current study area, the aforementioned historic pig farm (SIHP Site 3958) and Ahukini Landing (SIHP Site 50-30-08-9000). In 2015, International Archaeological Research Institute, Inc. (IARII) conducted a supplemental AIS for the Ho'oluna at Koheā Loa Housing Development Project, which had been previously studied by Walker and Rosendahl (1990) and Franklin and Walker (1994), located to the northeast of the current study area (see Figure 53). As a result of their fieldwork, a nine-feature site was recorded (SIHP Site 50-30-08-2295), which was interpreted as an irrigation network associated with the former Lihue Plantation Company's sugar enterprise. The series of ditches, culverts, sluice gates, and concrete bridge extends throughout the majority of their project area, and was interpreted as having been constructed primarily between 1910 and 1950 with periodic reconfiguration of the fields until as recently as 2000. No further work was the SHPD approved recommended treatment for this site.

In 2015, ASM Affiliates (Rechtman and Gotay 2016) conducted an Archaeological and Cultural Impact Assessment of roughly 3.1 acres of the Kaua'i Resource Center located immediately south of the current APE (see Figure 53). No archaeological features were observed on the surface and given the highly disturbed nature of the study area, it was determined that there was virtually no likelihood of encountering subsurface remains.

Table 4. Previous studies conducted in the vicinity of the Līhu‘e Transfer Station APE.

<i>Author(s) and year</i>	<i>Type of Study</i>	<i>Relevant findings</i>
Hammatt 1988	Reconnaissance	3 Historic wall remnants, a midden scatter, and one terrace
Hammatt 1990	Inventory	None
McMahon 1990	Field Inspection	3 previously recorded historic residences
Walker and Rosendahl 1990	Inventory	3 previously recorded historic residences
Walker et al. 1991	Inventory	10 archaeological sites comprised of fourteen features
Franklin and Walker 1994	Inventory	13 previously recorded sites
Creed et al. 1999	Inventory	None
Corbin et al. 2002	Inventory	Four complexes and six single-feature sites representing habitation, transportation, a historic cemetery, a possible burial, and a dump
Bell et al. 2006	Inventory	A historic complex of concrete enclosures and foundation remnants
Monahan and Hammatt 2008	Field Inspection	Identified irrigation works 1910-1950
Filimoehala et al. 2015	Inventory	20th century irrigation complex

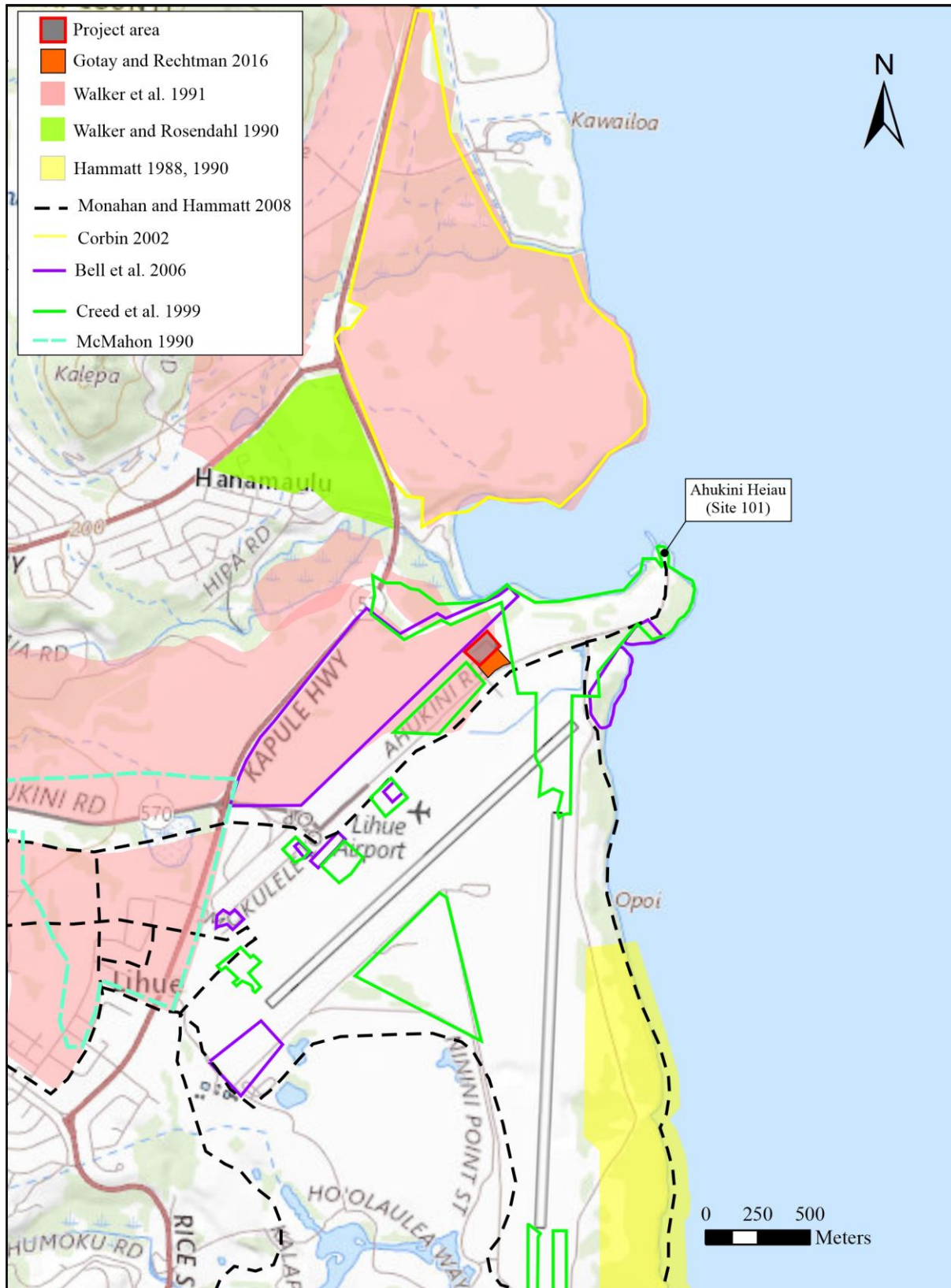


Figure 53. Map showing previous studies in the vicinity of the Lihue Transfer Station study area.

3. ARCHAEOLOGICAL EXPECTATIONS

Based on review and analysis of the culture-historical background and prior relevant studies, coupled with an assessment of current conditions, a set of archaeological expectations can be generated for each of the four refuse transfer station APEs.

HANALEI REFUSE TRANSFER STATION

During the Precontact Period, the Hanalei refuse transfer station APE might have seen opportunistic agricultural use along intermittent streams, however, beginning in the middle 1800s this area was developed for commercial farming and later as pasturelands. These historic activities likely destroyed any Precontact cultural remains that may have been present, and the modern development of the existing refuse transfer station likely destroyed any evidence of Historic Period land use. Although highly unlikely, the remote possibility does remain that scant remnants of either Precontact or Historic Period agricultural features might remain along the margins of APE.

HANAPĒPĒ REFUSE TRANSFER STATION

The archaeological expectations for the Hanapēpē refuse transfer station APE are meager at best. The extensive use of the APE associated with the existing refuse transfer station and adjoining County base yard likely destroyed any evidence of past land use be from the Precontact or Historic Period.

KAPA‘A REFUSE TRANSFER STATION

Precontact use of the general vicinity of the Kapa‘a refuse transfer station APE appears to have centered on dry land cultivation and resource collection; ephemeral site types that do not preserve well in the archaeological record. The specific property has been used as a public dumping ground since at least the middle of the twentieth century and it is anticipated that extensive bulldozing had occurred in the area prior to the establishment of the current use, which itself has had an extensive impact on both the surface and subsurface environment. Evidence of the historic use of the property as dump is likely to be observed around the periphery of the currently developed transfer station infrastructure; however, discovering evidence of such activity might not lead to the identification of a historic property, or at least one of any significance.

LĪHU‘E REFUSE TRANSFER STATION

The archaeological expectations for the Līhu‘e refuse transfer station APE are meager at best. The extensive Historic Period agriculture activities associated with sugarcane cultivation likely destroyed any Precontact cultural remains that may have been present, and the modern development of the existing refuse transfer station and adjoining recycling facility likely destroyed any evidence of Historic Period land use.

4. ARCHAEOLOGICAL FIELDWORK

METHODS

Archaeological fieldwork at all four refuse transfer stations was conducted on December 2, 2020 by Robert B. Rechtman, Ph.D. and Cyrus Hulen, B.A. The field crew visually examined the already developed portions of the respective APEs and more formally surveyed the currently undeveloped portions of the APEs by walking transects spaced at 5-meter intervals. The boundaries of the APEs were identified in the field using a handheld tablet computer running ESRI's Collector application connected to an EOS Arrow 100 GNSS receiver with sub-meter accuracy.

FINDINGS

Hanalei Refuse Transfer Station

No archaeological site, features, or cultural deposits were observed within the Hanalei refuse transfer station APE.

Hanapēpē Refuse Transfer Station

No archaeological site, features, or cultural deposits were observed within the Hanapēpē refuse transfer station APE.

Kapa'a Refuse Transfer Station

Archival research indicated that the Kapa'a refuse transfer station APE was a public "dumping grounds" dating back to the middle twentieth century. During the current fieldwork, rubbish was observed scattered around the APE, some of which could date back to the period when the modern refuse station was used as a dump. However, what was observed was not a discrete deposit that would represent intact deposition. Rather, there was a mix of recent and historic material as one would expect at a trash dump location. Further, even if an intact section of the original dumping ground could be identified, with respect to the significance criteria contained in 36 CFR part 63 such a site would be considered a common property type that does not have the potential to provide information about history that is not available through historic research, and thus would not be eligible for listing in the National Register of Historic Places. With respect to such a site being considered significant under HRS Chapter 6E, while the use of the area as a dump extends back more than 50 years, this site would not be considered a significant historic resource.

Līhu'e Refuse Transfer Station

No archaeological site, features, or cultural deposits were observed within the Līhu'e refuse transfer station APE.

5. STATEMENTS OF EFFECT

HANALEI REFUSE TRANSFER STATION

As no historic properties were identified within the Hanalei refuse transfer station APE, in accordance with 36 CFR 800.4(d)(1), the Section 106 determination is *no historic properties affected*. With respect to HRS Chapter 6E-8 and pursuant to HAR §13-275-7, the effects determination is “no historic properties affected.”

HANAPĒPĒ REFUSE TRANSFER STATION

As no historic properties were identified within the Hanalei refuse transfer station APE, in accordance with 36 CFR 800.4(d)(1), the Section 106 determination is *no historic properties affected*. With respect to HRS Chapter 6E-8 and pursuant to HAR §13-275-7, the effects determination is “no historic properties affected.”

KAPA‘A REFUSE TRANSFER STATION

As no historic properties were identified within the Kapa‘a refuse transfer station APE, in accordance with 36 CFR 800.4(d)(1), the Section 106 determination is *no historic properties affected*. With respect to HRS Chapter 6E-8, the middle twentieth century public dumping grounds use of the property could constitute a historic site, but such a site would not be considered significant under any criteria; thus, pursuant to HAR §13-275-7, the effects determination is “no historic properties affected.”

LĪHU‘E REFUSE TRANSFER STATION

As no historic properties were identified within the Hanalei refuse transfer station APE, in accordance with 36 CFR 800.4(d)(1), the Section 106 determination is *no historic properties affected*. With respect to HRS Chapter 6E-8 and pursuant to HAR §13-275-7, the effects determination is “no historic properties affected.”

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Attachment D

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